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ONE HUNDRED YEARS OF AMERICAN RAILROADING

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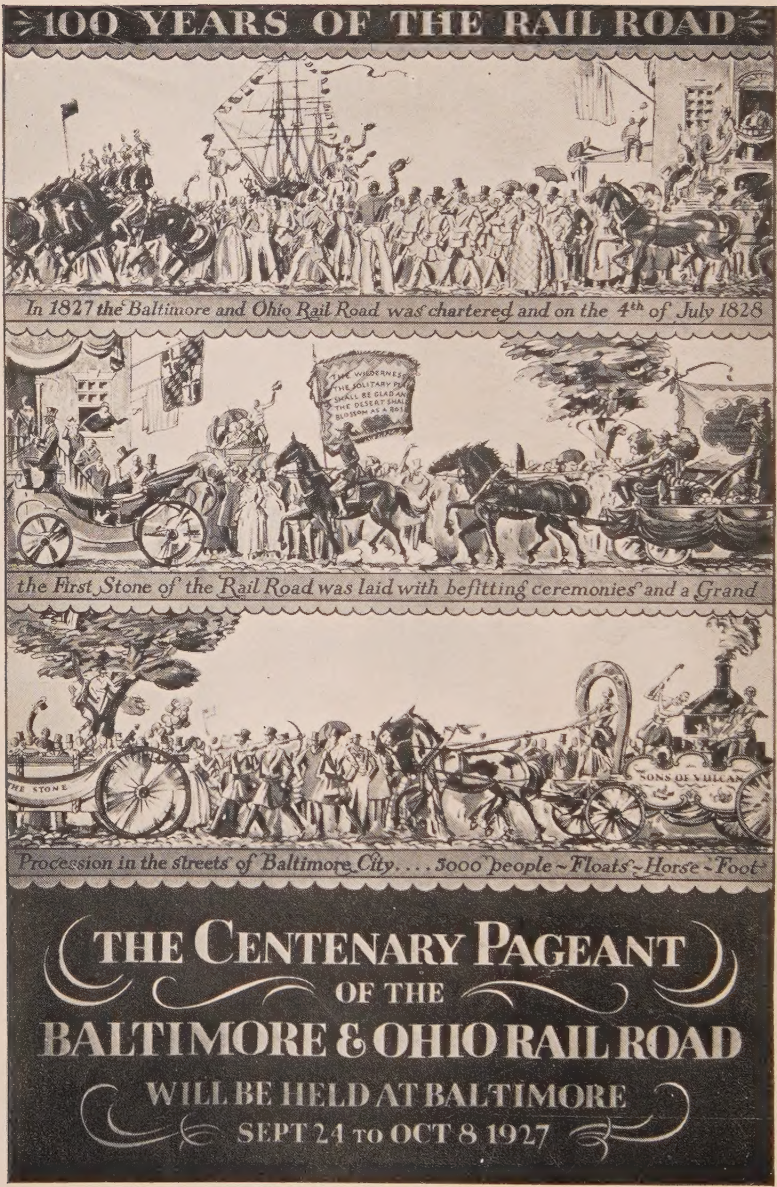

100 YEARS OF THE RAIL ROAD

In 1827 the Baltimore and Ohio Rail Road was chartered and on the 4th of July 1828 the First Stone of the Rail Road was laid with befitting ceremonies and a Grand Procession in the streets of Baltimore City.... 5000 people ~ Floats ~ Horse ~ Foot

THE CENTENARY PAGEANT
OF THE
BALTIMORE & OHIO RAIL ROAD
WILL BE HELD AT BALTIMORE
SEPT 24 TO OCT 8 1927

Courtesy, Baltimore and Ohio Railroad

CENTENARY POSTER

Designed by Edwin A. Wilson in Commemoration of the Fair of the Iron Horse, in 1927

6

ONE HUNDRED YEARS OF AMERICAN RAILROADING

By

JOHN W. STARR, Jr.

Author of
Lincoln and the Railroads

Illustrated

New York
DODD, MEAD & COMPANY
1928

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PRINTED IN THE UNITED STATES OF AMERICA
BY THE VAIL-BALLOU PRESS, INC., BINGHAMTON, N. Y.

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To

My Mother

ANNA ETTER STARR

INTRODUCTION

American railroads are just now celebrating their centenaries. How many of us stop to think of what this means? It means that, one hundred years ago, the lines of rail, now stretching in every conceivable direction, were unheard of—almost undreamed of. It means that the faithful servants of steam now running upon them were then regarded as but fantastic conceptions of some crackbrained inventor. To turn the pages of the past one hundred years of American railroading is like scanning some wonder tale of the Arabian Nights.

A century ago, our country itself was largely untrodden wilderness. Great stretches of virgin forest were pierced only by trails, or roads hardly worthy of the name. Hamlets only a score of miles apart were remote a day's journey. To travel from New York to Philadelphia was an adventure which caused even the hardiest traveler to pause. The coming of the railroad was the waving of the magician's magic wand. To this one factor, more than any other, we owe the opening up and development of our country. The history of the one is, indeed, coincident with that of the other.

If it be true, as a Western railway official has recently stated, that "next after the Christian religion and the public school, the railroad has been the largest single contributing factor to the welfare and happiness of the people," surely an account of the first hundred years should be of especial interest and benefit to us. With this idea in mind, the present volume has been prepared, the writer's only regret being that within the necessarily limited compass of a work of this kind adequate justice cannot be done such a subject.

Practically a hundred years ago the matter of railroad projection and construction began to interest the business and engineering minds of our then young republic. The late twenties and early thirties witnessed the inception of these ideas; hundreds of embryonic roads were incorporated, many of them at the time of chartering being practically in their death throes.

This has been a fascinating subject to me. I have builded, with pioneer promoters, the early struggling primitive lines: I have assisted them in framing the charters; I have watched the surveying and grading, and the road-beds take form, as they copied after our English cousins across the seas; I have tried out with them the use of horsepower and the inclined plane system; and have seen developed the American steam locomotive, as well as the try-outs of those of English make, from the first feeble efforts to our modern giants, the last word in locomotives; I have helped lay the great transcontinental systems; and last but not least, have worried along with the directors and officials, as they tried hard, and often failed dismally, to keep their heads above water financially by all the legitimate means at their disposal. We cannot hold these pioneers in too high regard for their first efforts; they were going somewhere but they did not know where. Our railroad development was practically coeval with the English, although the latter are generally given the credit for the first successful demonstration and operation of railroads.

As I waded through a mass of documentary and published accounts, and also obtained letters from many officials, I saw the embryonic beginnings slowly unfold and magnify unto the present magnificent proportions, one of the wonders of the age. The United States of America has the greatest railroad system in the world, the envy of all foreign countries. Her present heads are worthy successors of their early predecessors, who, in the light of their times, had as much intelligence and business acumen as our operating heads of to-day. The wonder is, that with so little light they accomplished so much. All honor to them.

The early lines had separate and practically contemporary beginnings, whether it was in the then thickly settled and cosmopolitan "East," embracing the Middle Atlantic States, intellectual New England, the lumber regions of Maine; or whether it was in the region south of the Mason-Dixon line along the coast, or west of the Alleghenies in the Blue Grass region of Kentucky, or in the far southland of the Gulf States.

To-day the total valuation put upon the railroads of the United States by the Interstate Commerce

Commission, which as we all know is considerably under the figures of the roads themselves, is approximately *twenty-six billions of dollars*, or thrice as much as the total stock of money in the United States. The railroads have four hundred and twenty thousand miles of trackage; seventy thousand locomotives, sixty thousand passenger cars, and two and a half million freight cars in service. Practically one-half of the world's steam mileage is located within our borders. All things considered, it is our greatest industry, and will continue so if we treat the situation wisely. There must continue to be regulation, but not too restrictive, which tends to destroy initiative. Our railroads in the past could not have forged ahead, had they been hobbled. Railroads of to-day have many handicaps over their competitors—motor trucks, bus lines, waterways, and other common carriers—in heavy taxes, road maintenance, high cost of operation, and other factors peculiar to rail lines. They should, therefore, not have the additional handicap of unfair discrimination.

I have completed this intensive study of certain phases of the first hundred years of American railroading with a profound feeling of respect and admiration for not only our pioneer promoters who took a step in the dark, but also for our present-day executives who direct the greatest system of transportation the world has ever seen.

In the preparation of this work, as in my former, I have been aided at every turn by railroad officials and publishers, as well as manufacturers whose products go largely into the business of railroading. To cite a typical instance among many—the late S. Davies Warfield, who was organizer and president of the National Association of Railroad Securities, besides being chairman of the board and president of the Seaboard Air Line Railway, took a personal interest in this history of the railroads and actively aided me until the time of his death, in 1927. Such as it is, I am deeply sorry not to be able to place the completed volume before him.

The book has been made possible, in fact, only by the active coöperation of officials all over the United States—to whom this is only partial acknowledgment. It has been compiled very largely from railroad publications and official documents. The railroads themselves recognized that now, as the hundredth milestone is being passed, it is high time that a mental inventory be taken of their past accomplishments. For example, last fall (1927) it was my great pleasure and privilege to attend the "Fair of the Iron Horse" held in Baltimore to celebrate the centennial of the Baltimore and Ohio Railroad. Other roads were asked to, and did, participate in this exposition—the most unique and successful educational exhibit of its kind ever attempted.

The author hereby acknowledges his indebtedness to the following railroad officials and others:

Messrs. Henry W. Faxon, president of the Granite Railway Company; H. A. Butler, president and general manager of the Mauch Chunk Switch-Back Railway Company; C. W. Woolford, secretary, and

Edward Hungerford, centenary director of the Baltimore and Ohio Railroad, as well as Robert M. Van Sant, editor of the *Baltimore and Ohio Magazine;* W. W. Atterbury, President, and G. B. Harley, Special Agent Publicity Department Pennsylvania Railroad, and Walton M. Wentz, editor of the *Pennsylvania News;* William F. Hooker, editor and H. H. Pratt, managing editor of the *Erie Railroad Magazine;* Ernest J. Van Droskey, assistant to consulting valuation counsel, New York Central; Pitt P. Hand, editor of the *New York Central Magazine*, and Charles Frederick Carter, New York Central historian; John L. Cobbs Jr., director of public relations, Atlantic Coast Line; W. E. Adams, special assistant to vice-president, Boston and Albany Railroad; T. F. Joyce, publicity manager, Boston and Maine Railroad; R. B. White, president Central Railroad of New Jersey; Edward F. Smith, assistant to president, Central Vermont Railway; L. F. Loree, president and W. J. Coughtry, recorder, Delaware and Hudson; W. G. Van de Water, secretary and treasurer, Delaware, Lackawanna and Western; E. E. Loomis, president, Lehigh Valley Railroad; J. J. Elder, executive assistant, Louisville and Nashville; Morris McDonald, president, Maine Central; R. H. Newcomb, assistant to vice president, New York, New Haven and Hartford Railroad; Holcombe Parkes, editor *Norfolk and Western Magazine*, and Frank Helvestine, chief clerk to vice president, Norfolk and Western; S. Davies Warfield, president, and G. Z. Phillips, assistant to president, Seaboard Air

Line; M. E. Bernet, general advertising agent, Wabash Railway; J. E. Gorman, president, Chicago, Rock Island and Pacific; C. F. Balch, statistician, Chicago and North Western Railway; W. W. Baldwin, vice president, Chicago, Burlington and Quincy Railroad; C. E. Kane, editor, *Illinois Central Magazine;* L. W. Baldwin, president Missouri Pacific Lines; W. B. Storey, president, Atchison, Topeka and Santa Fe Railway System; F. H. Johnson, assistant to receiver, and T. W. Burtness, secretary of the Chicago, Milwaukee and St. Paul Railway; Ralph Budd, president, Great Northern Railway; Charles Donnelly, president, Northern Pacific Railway; William Sproule, president, and R. E. Kelly, manager of development, Southern Pacific Company; Alfred Pittman, editor, *Union Pacific Magazine;* Paul T. Warner, advertising manager, Baldwin Locomotive Works; F. H. Field, of the publicity department of the General Electric Company; the secretary of the Lundie Engineering Corporation; Paul Cloke, dean of the University of Maine; E. E. Chase, of Beyer and Small, historian of Maine railroads; H. H. Cust, assistant to president, Mt. Vernon Car Manufacturing Company; Peter D. Vroom, of the Pullman Company; the officials of the Rail Joint Company; A. K. West of the Timken Roller Bearing Company; J. A. Ralston, chief of publicity, Westinghouse Air Brake Company; Mrs. W. T. Lafferty, of the University of Kentucky, and Mrs. Ella V. Starr, of Middletown, Pa., for the loan of her voluminous scrap-book of early Pennsylvania history, from which were taken excerpts from Colbaugh's "Recollections" appearing in Chapter IX.

Special mention should also be made of the executives of some of our prominent railroad systems for their courage and courtesy in venturing into a prophecy of the future: President William Sproule, of the Southern Pacific; President Carl R. Gray, of the Union Pacific; President W. B. Storey, of the Atchison, Topeka and Santa Fe; President Hale Holden of the Chicago, Burlington and Quincy; and President L. A. Downs, of the Illinois Central.

And finally I must again avail myself of the opportunity for expressing my appreciation of the editorial services of Mr. J. Walker McSpadden, of New York City, at whose suggestion this work was undertaken, and who has aided in the preparation and final revision of the text.

JOHN W. STARR JR.

Millersburg, Pennsylvania.
June 1, 1928

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ONE HUNDRED YEARS OF AMERICAN RAILROADING

I

EARLY AMERICAN LOCOMOTIVES

THE logical beginning in any story of railroading is not with the tracks, but with the engines. Early inventors did not concern themselves with the sort of track that their steam wagon was to run on, but with making the wagon itself go. In fact, the very first devices for the harnessing of steam were in stationary machines. As the principle of the piston and cylinder progressed, however, the idea soon took root that here was a means of locomotion which might displace the horse or ox.

It is an interesting historical parallel that the rise of steam locomotion is almost exactly coincident with the rise of the American Republic—and who shall say that our rapid strides as a nation are not due in large measure to this great modern ally?

At the time of the first mutterings of the American Revolution, James Watt, in England, was conducting his first active experiments in steam locomotion. In America, the same problem was intriguing Oliver Evans, an inventor who was so fired with enthusiasm that he spent years in trying to interest others in the commercial use of steam as a motive power. Few understood at all what he was talking about, and those who did were not anxious to risk their money on such a chimerical venture. However, soon after the Revolution he did have some of his ideas patented, one such patent being granted on the specious grounds that "it would do no harm"! Indeed, he was generally regarded as a "steam maniac," and his views held to be absurd. But while Richard Trevethick, an English mechanician, is generally credited with the first high-pressure engine, there is good authority for the statement that Evans actually preceded him; one encyclopedia saying that "there are strong grounds for suspecting that his suggestions may have aided Trevethick in perfecting his locomotive and high-pressure engines." To Trevethick, however, is accorded the palm for having designed the first steam locomotive to run upon rails. This was in the year 1803.

The following year, in Philadelphia, Evans built a fearful and wonderful contraption. It was called "Oructor Amphibolis" and doubtless lived up to its name, as it was a scow mounted on wheels, propelled by steam, and intended to run on either land or water—surely an ambitious project! We can imagine the sensation it created when the proud inventor actually gave a successful demonstration through the street leading from his factory to the river, into which the fire-breathing monster plunged with an awful splash. Shortly after, Evans published a book describing his steam engine and its possibilities of practical application to boats and "carriages on turnpike roads."

Another American of this period is generally hailed as "the father of the American Railroad system." This was John Stevens, whose fine old estate in Hoboken, across the Hudson from New York, was the scene of many an interesting experiment. Among other things, he constructed a half-mile track, upon which he ran a locomotive of his own construction. It had a multi-tubular boiler and other ingenious features. This was in the year 1825. Stevens was then an old man of seventy-five, and, like Evans and others, had tried vainly to enlist popular support for his theories in railroading—only to be laughed at for his pains.

Meanwhile, in more than one quarter a pressing need for this new type of motive power was being felt. The Delaware and Hudson Canal Company had a short line of track running from Honesdale, Pennsylvania. Hearing of the success of some steam locomotives in England, they sent their engineer, Horatio Allen, to investigate them. As a result of his mission, four engines were contracted for—one being made by the famous Stephenson. Another was built by the firm of Foster, Rastrick and Company, and was christened "Stourbridge Lion"—for all locomotives at first had individual names. This famous engine has the honor of having been the first successful steam locomotive operated on a railroad in America.

The cost of the "Stourbridge Lion" was about $3,000—a considerable sum in those days; and the cost of its transportation must also have been considerable. By sea, river, and canal it travelled until it at last reached its destination, Honesdale, in the latter part of July, 1829. On the 8th of August, Allen, not wishing to jeopardize the safety of anyone else, drove the engine himself on its trial trip some three miles, and by reversing the engine safely returned to the starting point. But while the run was made with comparative safety, the nature of the light track with a stretch of curved trestle-work made the "Lion" unsuited for its job, and the owners of the road reluctantly abandoned the idea of steam locomotion for some years. The locomotive, which was in no way to blame, as it had run successfully, was laid aside, with its three running mates, which had also arrived from England. All were allowed to rust themselves into the discard. The "Stourbridge Lion" was housed alongside the track for twenty years, when it was taken to the Company's shops at Carbondale, and its boiler put into service there.

Another celebrated inventor of those days was Peter Cooper, of New York. Avidly reading everything he could lay his hands upon regarding the new power, he followed with keen interest the arrival of the "Lion" and its trial run. He then turned his attention to constructing a locomotive for himself, and to demonstrate the practicability of steam locomotion for the benefit of the Baltimore and Ohio Railroad. His creation was like nothing else on land or sea. It was mounted on a small carriage with four wheels each two and a half feet in diameter, and was provided with an upright boiler using rifle barrels for tubular flues. It was aptly called "Tom Thumb" and looked like a toy—but it ran! To the amazement of the onlookers it easily towed two cars containing forty passengers, and at an unbelievable speed of eighteen miles an hour. We shall have more to say about this remarkable pioneer among American locomotives in another chapter.

In point of order the next locomotive to attain distinction was the "Best Friend of Charleston," and was constructed by the West Point Foundry for use on the South Carolina Railroad. This engine was the first built and actually operated in America for commercial purposes. On January 15, 1831, after several trial trips the preceding year, it was attached to the first train-load of passengers ever so hauled in this country. Its operation seems to have been a success, and for the next six months it faithfully did its bit drawing a train on regular schedule, at the rate of from fifteen to twenty-five miles an hour. It might have run for many more months, but for the misguided zeal of a negro fireman who, exasperated by the noise of escaping steam from the safety valve, proceeded to hold it down. A badly scared as well as physically injured darky was picked up some distance away, when the boiler exploded.

The same road then ordered a second engine from the same firm. It was called "West Point," and likewise did good service.

Meanwhile, up in New York the progenitor of the New York Central lines, the Mohawk and Hudson, was likewise seeking a workable engine. Their Chief Engineer, John B. Jervis, hearing of the successful models turned out by the West Point Foundry, engaged the same company to make a trial engine for his road. The result was the "DeWitt Clinton," the first and most famous of the thousands of locomotives since put in use by this great system. It weighed nearly 7,000 pounds; it was eleven and a half feet long, and was mounted upon four wheels, each four and a half feet in diameter. It had a tubular boiler with copper tubing, a drop furnace and two fire doors. At the rear end of the boiler were two cylinders —one on each side—each five and a half inches in diameter and having a sixteen-inch stroke. The cylinders were connected with the axles of the front wheels, and the rear wheels were driven by connecting rods. The cylinders were inclined, and the pumps operated vertically by bell crank. There was a tender with tank for water and space for wood, which was then used as fuel.

Famous as the "DeWitt Clinton" has been, its actual record of service was poor. It was tried out on August 9, 1831, and while it ran and was put on the road, several defects in its construction developed, so that within two years it was retired, and two years later scrapped entirely. The present exhibition models are reconstructions. The locomotive, however, reached a speed of fifteen miles an hour and, it is claimed, on occasion was forced into twice this speed. Perhaps this is why it didn't last long.

In this same year, 1831, the Baltimore and Ohio road offered a prize of $4,000 for the "most improved engine." The specifications were that it was not to exceed three and a half tons in weight, but should be capable of "drawing, day by day, fifteen tons, inclusive of the weight of the wagons, at fifteen miles per hour." To a watchmaker of York, Pennsylvania, was awarded the coveted prize. His engine was christened the "York," and it had to be hauled across country—and hilly country at that—by a long string of panting oxen, for a distance of sixty miles. These were some of the joys of pioneer railroading!

Like the "DeWitt Clinton," this engine was mounted on four wheels and of similar construction, but the diameter of the wheels was only two and a half feet. In July of this year (1831) it was put into active service, and the records of the road show that it hauled a train of five cars, with 150 passengers, at from twenty to thirty miles an hour—no mean accomplishment.

One of the most efficient of these early locomotives was an English-built one, called the "John Bull." It was shipped to this country in 1831, and placed on the tracks of the Camden and Amboy road, on November 12. It seems to have been a success from the start, and worked for several years until retired in favor of later models. This old warhorse was on exhibition at the Centennial Exposition at Philadelphia, in 1876; and the Chicago Exposition of Railway Appliances, in 1883. It was then placed in the Washington Museum, until the year 1893, when it was actually fired up again and under its own head of steam hauled the "John Bull" train to the World's Fair at Chicago. Not content with that, it cheerfully went to work upon the Fair grounds, hauling in the aggregate 50,000 passengers in the Terminal Station yard; and this, mind you, was a locomotive over sixty years old and built when such engines were in their infancy! After the Exposition, it steamed back to Washington for a well-earned rest.

In 1832—still following this record chronologically—the Baltimore and Ohio road put another American-built engine into service. It was designed by Phineas Davis, their First Master Mechanic, and was called the "Atlantic." Like the "John Bull," it saw active service for the next sixty years, being frequently placed upon exhibition. Both the "York" and the "Atlantic," on account of their "uncanny lankiness" were called "grasshoppers," a word which has stuck in describing a certain peculiar type of engine still in use.

The second engine which was purchased for the Mohawk and Hudson road was a creation of Stephenson in England, and has sometimes been referred to as the "Robert Fulton," the original name chosen for it. But on account of its English make it was dubbed the "John Bull." This engine was not the same, however, as one of a similar name used by the Camden and Amboy road.

The engineer on the Mohawk and Hudson road who first handled their "John Bull" could not help but make comparisons between it and the American engine, "DeWitt Clinton," to the disparagement of the foreign-make, saying that "the contrast between this engine and the American one was great, the latter being a beautiful, light, racehorse-looking machine, while the former looked heavy and 'elephantic.' However, it proved to be an excellent machine, and the writer has frequently driven it with a train of cars behind it, five miles in twelve minutes." Another engineer said of it: "The spokes and rims, or felloes, were made of wood and secured by wrought-iron flanged tires, and it is perhaps needless to say that after this engine was put in use, those parts of the wheels made of wood gave audible complaint of hard service. The 'shrieking' of the machine caused no little merriment among the knights of the whip." An interesting further fact about this engine is that, in 1838, it was entirely rebuilt, nothing of the original machine being retained but the boiler.

And now we come to a name destined to become as famous in connection with locomotives, as a certain Henry Ford became, at a later date, for motor vehicles of another type. This man was Matthias W. Baldwin, and when we first hear of him he was a Philadelphia jeweler. At the request of the Philadelphia Museum—after imperfect news had seeped in from England, with sketches of embryonic locomotives being tried out there,—he constructed a miniature engine for use upon a circular track in the Museum. On April 25, 1831, it received its first tryout, and thereafter sightseers had the privilege of riding in the little cars attached to it, each car holding four passengers.

The fame of this model spread, and in the latter part of the same year Baldwin received a commission from the Philadelphia, Germantown and Norristown Railroad, then operating by horse-power, to build an engine for them. Learning that the Camden and Amboy road had in storage in Bordentown an English machine, Baldwin, with Peale, the head of the Museum, made an inspection of it and with a few notes commenced operations.

"The difficulties to be overcome," says the present management of the great Baldwin works, "in filling the order can hardly be appreciated at this day. There were few mechanics competent to do any part of the work on a locomotive. Suitable tools were with difficulty obtainable. Cylinders were bored by a chisel fixed in a block of wood and turned by hand. Blacksmiths able to weld a bar of iron exceeding one and one-quarter inches in thickness were few, or not to be had. It was necessary for Mr. Baldwin to do much of the work with his own hands, to educate the workmen who assisted him, and to improvise tools for the various processes."

Christened "Old Ironsides," his first creation was turned over to the road and given a trial trip, November 23, 1832. On the following day, the *United States Gazette* said of it: "A most gratifying experiment was made yesterday afternoon. The engine traveled about six miles, working with perfect accuracy and ease in all its parts, and with great velocity." Another journal spoke of the "highly successful" performance "in the presence of several gentlemen of science and information on such subjects" (a delightfully vague way of reporting!) and further stated that "the engine moved in beautiful style, working with great ease and uniformity." As to the engine itself, it was said that "the principal superiority over any of the English ones consists in the light weight—which is between four and five tons—her small bulk, and the simplicity of her working machinery."

Despite the acclaim, the pioneer locomotive builder was discouraged. He saw only too well the faults of his creation, and as he viewed the difficulties encountered in building it, with green help and poor tools, he was tempted to quit. He told one of his friends that "this is our last locomotive." But public demand was too strong for him. One road after another was eagerly seeking engines, to displace their horse-cars. So we are not surprised to find him, two years later, putting the finishing touches to two new locomotives—one, called the "Baldwin," after him, for use on the South Carolina road; and the other, the "Lancaster," for use on the Philadelphia and Columbia line.

A recent history of the Baldwin Locomotive Works, which in succeeding years has risen to dominance in this great industry, gives us a detailed description of his famous first engine, "Old Ironsides," and as it was the acorn from which the mighty oak has sprung, we quote this description verbatim:

"The 'Ironsides' was a four-wheeled engine, modeled essentially on the English practice of that day, as shown in the 'Planet' class, and weighed, in running order, something over five tons. The rear or driving wheels were 54 inches in diameter on a crank axle placed in front of the fire box. The cranks were 39 inches from center to center. The front wheels, which were simply carrying wheels, were 45 inches in diameter, on an axle placed just back of the cylinders. The cylinders were 9½ inches in diameter by 18 inches stroke, and were attached horizontally to the outside of the smoke-box, which was D-shaped, with the sides receding inwardly, so as to bring the center line of each cylinder in line with the center of the crank. The wheels were made with heavy cast-iron hubs, wooden spokes and rims, and wrought-iron tires. The frame was of wood, placed outside the wheels. The boiler was 30 inches in diameter, and contained 72 copper tubes, 1½ inches in diameter, and seven feet long. The tender was a four-wheeled platform, with wooden sides and back, carrying an iron box for a water tank, inclosed in a wooden casing, and with a space for fuel in front. The engine had no cab. The valve motion was at first given by a single loose eccentric for each cylinder, placed on the axle between the crank and the hub of the wheel. On the inside of the eccentric was a half-circular slot, running half way around. A stop was fastened to the axle at the arm of the crank, terminating in a pin which projected into a pin which projected into the slot. The engine was reversed by changing the position of the eccentric on the axle by a lever operated from the footboard. This form of valve motion was, however, shortly afterward changed, and a single fixed eccentric for each cylinder substituted. The rock shafts, which were under the footboard, had arms above and below, and the eccentric straps had each a forked rod, with a hook, or an upper and lower patch or pin, at their extremities, to engage with the upper or lower arm of the rock shaft. The eccentric rods were raised or lowered by a double treadle, so as to connect with the upper or lower arm of the rock shaft, according as forward or backward gear was desired. A peculiarity in the exhaust of the 'Ironsides' was that there was only a single straight pipe running across from one cylinder to the other, with an opening in the upper side of the pipe, midway between the cylinders, to which was attached at right angles the perpendicular pipe into the chimney. The cylinders, therefore, exhausted into each other; and it was found, after the engine had been put in use, that this was a serious objection. This defect was afterward remedied by turning each exhaust pipe upward into the chimney substantially as it is now done. The steam joints were made with canvas and red lead, as was the practice in English locomotives, and in consequence much trouble was caused, from time to time, by leaking."

Another of Stephenson's productions for use in America was called the "Stephenson," in his honor, and was run over the Boston and Lowell tracks, in 1835. The trial distance, twenty-six miles, was made "in the then astounding time of one hour and seventeen minutes, and the return trip, with twenty-four passengers aboard, in one hour and twenty minutes." The boiler of this engine was "enclosed in wooden lagging and was painted a vivid green with black bands and stripes."

All these early locomotives were without cabs or other protection from the elements. The hardships of the pioneer engineers and firemen must have been severe. One historian says that "it was not uncommon to see the engineer covered with ice like a coat of mail" at the end of a run. Nor were the engines equipped with whistles, bells, sandboxes, headlights, pilots, cowcatchers, spark-arresters, or any other of the many devices long since regarded as necessities. They were just devices for driving wheels upon a track, and that is about all.

For example, the problem of running around a curved track was long exceedingly bothersome. To John B. Jervis, of the Mohawk and Hudson road, is given the credit for originating the idea of a swivelling truck of varying number of wheels, to be placed ahead of the drivers, not only to permit the weight of the engine to be spread over more wheels, but more particularly to provide a flexibility of wheel-base then so necessary on the curvatures of the early American roads. The title of "bogie," which was derisively given it by English railroaders, is still applied to this principle devised by Jervis, in 1832, and now in use upon all American engines.

Space does not permit us to follow the further experiments of Baldwin, or his contemporaries, Norris, Campbell, Harrison, Milholland, Ross Winans, and others, by whose efforts American railroading early sprang into the forefront of the industrial development of the world—a position which it has retained ever since. The topic is fascinating and would lead one far afield. One other important factor in this early development, however, must not be overlooked—and that is, the *roadbed*—the sort of track upon which these first contraptions of wood and iron puffed their noisy but triumphant way. This will be taken up in our next chapter.

II

EARLY ROADBEDS AND EQUIPMENT

The railway track—like Topsy—just grew. Its evolution was by slow but extremely natural means. Before the days of steam locomotion wagon drivers found that they could haul much larger loads across country, if planks were put down for their wagons, especially if there were a boggy stretch. Both in England and America, not to speak of other countries, we find records of early tram lines usually made of long strips of wood, laid end to end. The next natural step in this evolution was to fasten thin strips of iron on the top of the wood, to give it longer service.

While horses or oxen drew the cars, the space between the rails was filled with ashes or gravel. One of the first roadbeds of this type was laid near Newcastle, England, in 1602. It was a hundred years later, that strips of light, malleable iron were employed, and not until the time of the Revolution and Watt's first experiments, that cast-iron bars were used. The first short railway opened for actual traffic in England was in 1821. The Stockton and Darlington line began regular service in 1825.

In this country, one of the first, if not the first road made with rails was one built by Gridley Bryant. It was a tramway laid in 1826, to haul granite, in Massachusetts, for the erection of the Bunker Hill Monument. Its cars were hauled by horses. About the same time, the Delaware and Hudson Company built a line in northeastern Pennsylvania, to tap their coal mines, and also employed horses at first as the motive power. Hard upon these come reports of other early lines, in the late twenties and early thirties—just a century ago. Companies from New England down the coast as far as South Carolina, and soon stretching across the Alleghenies into the Middle West, were striving, one after another, to grade their roads and build them, each after its own pattern and width.

However, as the present writer has pointed out in an earlier book,[1] these pioneer companies faced peculiar difficulties, not merely of engineering but also of popular opinion. The railroads were looked upon by most people, particularly by the early legislators, as only improved common highways. They were classed with the macadamized turnpike, and their first charters were patterned after the turnpike charters. Their use was not to be limited to the holding company, but was open to any person who could comply with the rules as to weight allowed, style of cars, and form of wheels. Further, the gauges were of varying width for different roads.

The English width was four feet, eight and one-half inches, the standard gauge in use both there and in this country to-day. When in compliment to the Baltimore and Ohio centenary, in 1927, an English locomotive was shipped over to this country, it was swung by powerful cranes right on an American track, and ran under its own power. But long, painful years of experiment in this country were required to reach standardization. The English gauge prevailed early in New England, as it did later in the mid-West. The South used generally a five-foot width; while in the Middle Atlantic states there was no uniformity. One road, the Erie, actually began with six feet. Indeed, it was not until the strain of through traffic compelled uniformity, that a standard was set for the whole country. As late as Civil War times, we find President Lincoln wrestling out with the engineers of the proposed Union Pacific, the first transcontinental line, the problem of standard gauge.

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[1] "Lincoln and the Railroads," by John W. Starr Jr.

The roadbeds, with certain local differences, were of similar type. They were extremely crude, however, when compared with modern construction, as was shown graphically in the Baltimore and Ohio exposition, already referred to. One peculiarity of these pioneer roads was the right-of-way, or route, usually followed. As a rule, funds were scarce and the engineers, in surveying a route, followed old roads or trails around farms and over hills and dales, with little attempt to cut or fill. Sharp curves and steep grades resulted—a terrible handicap to the first proponents of steam power.

The route located, the next step was to prepare the roadbed. In the case of the Mohawk and Hudson road, pits two feet square and three feet apart were dug, and filled with cracked stone. The Boston and Lowell road made parallel trenches, three feet deep and five feet apart. Construction similar to these was followed by several other companies, yet in some instances the piling system was used—notably in building the Erie Railroad, where a hundred miles of wooden piles were actually sunk, at a cost of upwards of a million dollars. The dollars, as well as the timber, were sunk in this venture, as no track was laid on the tops of these piles; yet down South, the Charleston and Hamburg road actually constructed and for some years operated their trains on a system of piles, until the decay of the timbers compelled their abandonment.

The piling system of the Erie deserves more than passing mention. It was undertaken at the suggestion of their President Lord, who thought that he saw many advantages. The cost would be nominal, as it could be done in half the time it would require to construct a graded roadbed; it would eliminate the annual expenditure for ties and other repairs; there would be no damage suits due to trespassers; frost, snow, and flood could not interfere with train operations; in fact, "the interest on the money saved" would "renew the piles, if necessary, every five years."

The piles were of white oak, and from ten to sixteen inches in diameter at the butt. None was less than eight feet long. Pile-drivers run both by steam and man-power were employed to drive them into the ground, four feet apart longitudinally, and six traversely, until a sound foundation was reached. None was driven less than five feet down, and if the required firmness was not then obtained, a second pile driven on top. At one spot piles as large as telegraph poles were required, and one driven on top of another to a depth of 140 feet. Between the rows of piling great quantities of other filler were used, such as rock and untrimmed trees, in order to make a substantial roadbed. It is stated that even up to the present time, large quantities of stone are being continually dumped at this place, to keep replacing the fictitious bottom placed there by Lord's folly.

From early days the familiar "tie" or "crosstie" was employed in some form. Some of the roads used wooden ties, or "sleepers." Others with an abundance of stone cut out blocks of this, to which the rails were riveted. The wooden ties soon displaced stone, however. The Mohawk and Hudson road, instead of laying stone ties across the roadbed, as did others, simply set square stone blocks in stone filled pits, although "cross sleepers" of rounded timber were laid, every twenty-one feet, in order to keep the rails parallel and more firmly in position.

As for the rails on which the carwheels ran, these were at first of wood, and were called "stringers." The Granite Railway used pine timber, while the Delaware and Hudson used hemlock. Later, strips of harder wood were spiked on top. The stringers ran from twenty to thirty feet, and from six inches to a foot thick, being kept in place by wedges on both sides driven into the ties. The Lexington and Ohio road tried out limestone stringers, from ten to eighteen feet long; but the frosts of the first winter cracked them so badly that they were useless and had to be replaced with wooden ones.

The first attempts at metal rails (which were not called rails in those days) were of wrought, or rolled, or cast iron, and were variously termed "rail plates," "strop iron," or "bars." Their usual length was from fifteen to twenty feet, width two and a half inches, and thickness half an inch. They were fastened with spikes or screws, the ends fitting into each other by means of tongues and grooves. These thin strap rails were in use for many years, in spite of their drawbacks, often being reinforced at their junctions by iron plates, for it was here that they most often proved their unreliability. The ends would come loose from the wooden rails and curl up, due to the rapid motion of the train, and many accidents are related of these "snake-heads" coming up through the bottom of the cars, to the discomfiture if not positive injury of some luckless passenger.

One of the most interesting features of the Baltimore and Ohio exposition was that showing the gradual evolution of the rail until it reached the familiar "T" type in use to-day. But the weight of the T rails has been subject to continual increase as the strain of modern railroading, with heavy, high-speed trains have made increasing demands. And not only the rails, but every detail of track construction, such as the switches, has received prolonged study from our engineers. The Twentieth

Century Limited can enter a terminal over a vast network of branching tracks, with scarcely a jar to tell the passenger overhead that more than one line of rail is in use.

The ballasting of the roadbed, the crowning of curves, the elimination of all possible grades by the tunnelling of mountains of solid rock, if necessary, and the throwing of gigantic viaducts across valleys —such as the Tunkhannock Viaduct on the Lackawanna Railroad—these are but a few of the strides made in railroad making during the past century.

The equipment of the first railroads can be mentioned in a few words—for there wasn't any, in the modern sense. We have already spoken of the engine cab open to the elements. The passenger cars which were attached were of the type of contemporary stage-coaches. They were mounted on four-wheel trucks and at first carried only six passengers each. The wheels were flanged, in order to keep the cars in proper position on the iron straps which ran along the top of the wooden rails.

As the new mode of travel became more popular, larger cars were built, but still lacking any of the comforts of the modern coach. A historian of the pioneer road in Illinois says: "The only passenger coaches the road possessed were about the size and build of the big omnibuses of the past generation. The seats ran along each side, like those of the omnibus, and the coaches were equally destitute of any and every appliance for the comfort or convenience of the traveler, other than to sit down and hang on—if he could. The speed of the trains was very low, as speed is now measured, but it was, relatively to that to which the generation was accustomed, nearly as high as we now habitually know, the roadway was very uneven, there were no straps to hang to, and the lurching of the passengers unfortunate enough to be obliged to stand, their stumbling over and trampling upon the feet of the seated travelers, into whose surprised embraces they not infrequently stumbled and sprawled, were often vastly amusing to onlookers, howsoever exasperating to the participants. It was often equally disagreeable when passengers were few. There were no divisions of any kind in the seats. Along each wall of the coach ran a smooth stretch of bench-like seat, and a sudden lurch of the coach would often slide a sitter half the length of the coach, and land him or her with a gruesome bump in the middle of the floor.

"Cars were coupled only with the long link and pin," he continues, "operated by hand and resulting in any train of a number of cars suddenly stretching or shrinking in length with sudden changes of speed as much as a score or more of feet, with sudden jars and hazards unknown on modern trains. There was no means then known for warming the water in the tank of the locomotive tender, and the only known means for conveying it from the tank to the boiler was by ordinary leathern hose swinging freely enough between the two to assure immunity from breaking in any one of these sudden elongations of the train. Often a stop of two or three minutes at any station exposed to the bitter blasts of winter would suffice to freeze the water in these hose, tying up the train for from a few minutes to several hours, destitute of any means of informing anybody of the cause and probable duration of the delay. Then it became necessary for the train crew to take wood from the locomotive tender and carefully build a fire on the ground between the rails, and under the hose where it passed in festoons from tank to boiler, watching it like a hawk lest it scorch the leather, in which case the hose would crack and burst, and the locomotive be left hopelessly 'dead'."

The same writer tells of frequent occurrences where the train stalled out on some remote spot on the prairie, far from both fuel and water, when the disgusted passengers would have to file out of the cars and help the crew get it started again; which might mean cutting wood or carrying water a mile or more in buckets from some well or creek.

It was not long, however, before the progressive spirit asserted itself in a general improvement of equipment, as the following excerpt from a journal of the early forties shows:

> "Yankee ingenuity is rarely more pleasantly exemplified than in the luxurious arrangements for railroad traveling, of which we now have in Rochester a magnificent specimen—in the splendid train of passenger cars just launched for the sov-

> ereign people, on the Auburn and Rochester Railroad. There are six cars designed to form two trains. The cars each are twenty-eight feet long and eight feet wide. The seats are well stuffed and admirably arranged with arms for each chair, and changeable backs that will allow the passengers to change 'front to rear' by a manœuvre unknown in military tactics. The size of the car forms a pleasant room, handsomely painted, with floor matting, with windows secured from jarring, and with curtains to shield from the blazing sun. We should have said rooms; for in four out of six cars (the other two being designed only for way passengers) there is a ladies' apartment, with luxurious sofas for seats, and in recesses may be found a washstand and other conveniences. The arrangement of the apartment for ladies we consider the greatest improvement; and it will remedy some serious objections that have hitherto existed against railroad traveling on the part of families, especially where any members are in delicate health. The ladies can now have their choice either of a sofa in their own apartment, or a seat in the main saloon of the cars, as their health and inclination may require. These cars are hung on springs, and are of such large size that they are freed from most of the jar, and especially from the swinging motion so disagreeable to most railroads."

It was many years, however, before signals of any sort, trustworthy brakes, lights other than candles or leaky oil lamps, the telegraph, and many another adjunct now accepted as a necessity, became a part of railroad equipment. As for dining and sleeping cars, not even the most crack-brained visionary had yet dreamed of such things.

III

THE FIRST TWO RAILROADS IN AMERICA

To the Granite Railway Company of Massachusetts must be accorded the palm for having constructed and put into operation our first successful railroad. Although only three miles in length, operated by horse-power and gravity, carrying no passengers, and employed only to convey granite from the quarries to tidewater, it yet deserves the distinction accorded it by historians.

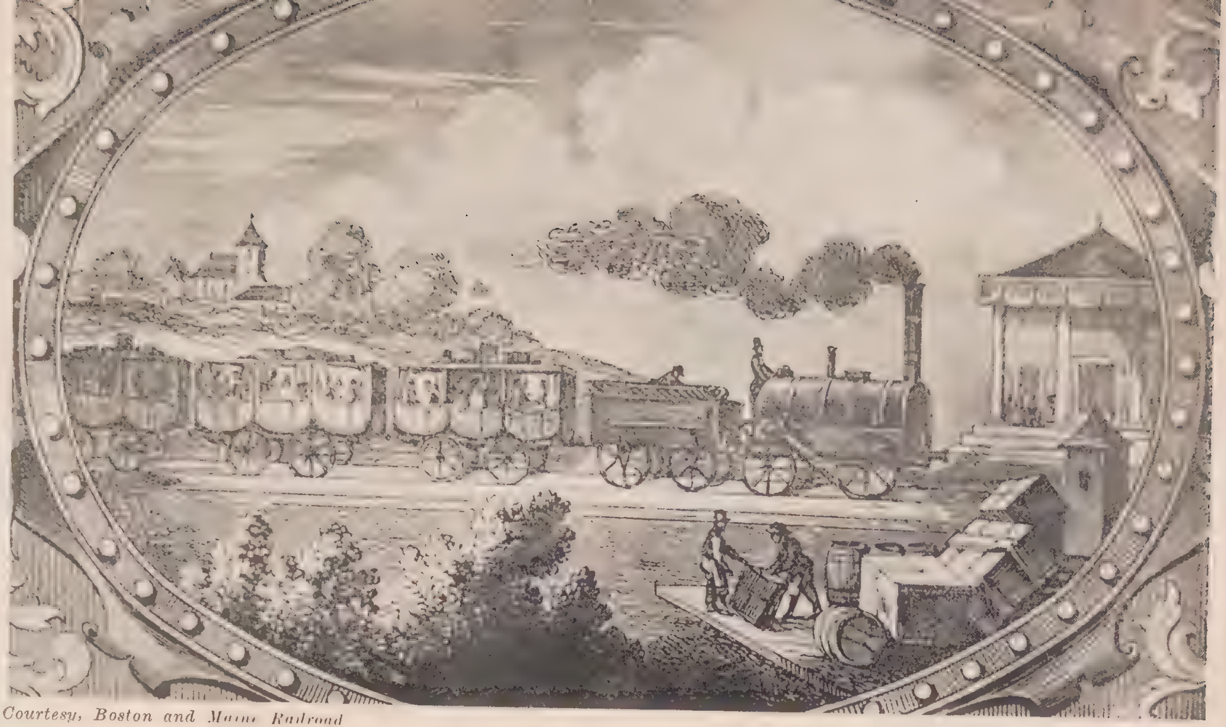
The original project harks back to the year 1823—although no railroad project was then in mind—when a body of public-spirited citizens of Massachusetts—among them, Daniel Webster, Washington Allston, the artist, and George Ticknor, the educator, formed an association for the erection of a monument to commemorate the Battle of Bunker Hill. Some two years later the corner-stone was laid by Lafayette, and Webster delivered his famous oration, at the greatest celebration that New England witnessed for many long years.

However, the laying of a corner-stone and the completion of a towering shaft of granite were two entirely different problems, as the committee in charge speedily found out. It required, in fact, twenty years to put the capstone in place. Solomon Willard, an architect of repute, was given charge of the work and, as his secretary reported later: "It was by his labors and taste that the plan was adopted and the stone quarry secured and the work done in a style that will be approved by generations to come. He walked three hundred miles to examine granite quarries, gave a thousand dollars to the association, and worked like a dog for years for merely his necessary expenses."

It was soon seen, by Willard and his backers, notably Gridley Bryant and Thomas H. Perkins, that something more substantial than a dirt road was needed for the hauling of the granite blocks. Bryant in particular advocated the construction of a railway—certainly a novel idea in America at that time —which should extend from Quincy, where the quarries were located, to the Neponset River; whence the stone could be lightered to Charlestown. Although enthused with his project, Bryant found only a lukewarm body of associates, and it was only after strenuous efforts on the part of the promoters that the others would give their consent to the innovation. Colonel Perkins, in fact, was the only one who was willing to risk his hard-earned cash in the venture.

A charter was granted by the state legislature, on March 4, 1826, for the road; construction was immediately begun; and on October 7 the formal opening occurred. Bryant himself wrote a description of this road, some years later, which is probably the best and most authentic account extant. He says:

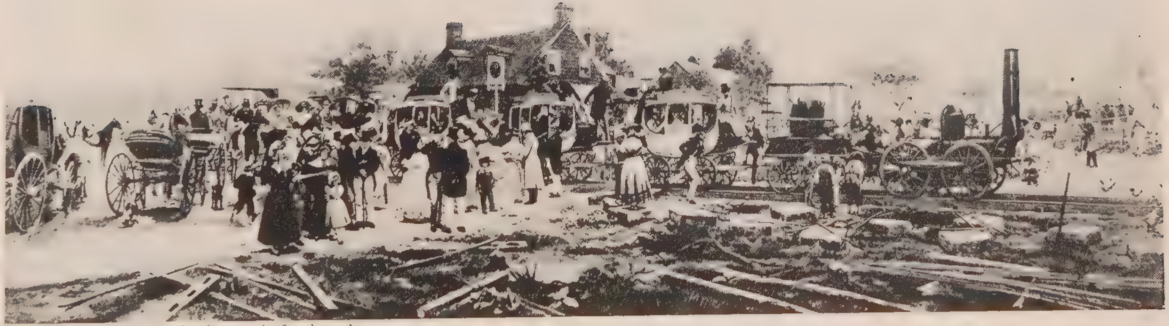
"The deepest cutting was fifteen feet, and the



Courtesy, Boston and Maine Railroad

FIRST TRAIN ON THE BOSTON AND LOWELL RAILROAD

This scene, reproduced from an old print, shows a locomotive built by George Stephenson, of England, with its train of stage-coach cars, as it appeared on its first trip, June 17, 1835



Courtesy, New York Central Railroad

FIRST RAILROAD IN THE STATE OF NEW YORK

The "DeWitt Clinton" with its train stage-coach cars departing from Schenectady, September 24, 1831 highest elevation above the surface of the ground was twelve feet. The several grades were as follows: the first, commencing at the wharf or landing, was twenty-six feet to the mile, the second thirteen feet, and the third thirty-six feet. This brought us to the foot of the table-lands that ran around the main quarry; here an elevation of eighty-four feet vertical was to be overcome. This was done by an inclined plane 315 feet long, at an angle of about fifteen degrees. It had an endless chain to which the cars were attached in ascending or descending. At the head of this inclined plane I constructed a swing platform to receive the loaded cars as they came from the quarry. This platform was balanced by weights, and had gearing attached to it in such a manner that it would always return (after being dumped) to a horizontal position, being firmly supported on the periphery of an eccentric cam. When the cars were out on the platform there was danger of their running entirely over, and I constructed a self-acting guard, that would rise above the surface of the rail upon the platform as it rose from its connection with the inclined plane, or receded out of the way when the loaded car passed on the track; the weight of the car depressing the platform as it was lowered down.

"I also constructed a turn-table at the foot of the quarry, which is still in use as originally constructed. The railroad was continued at different grades around the quarry, the highest part of which was ninety-three feet above the general level; on the top of this was erected an obelisk or monument forty-five feet high."

The roadbed was exceedingly primitive, like others of a slightly later construction. The foundation consisted of crushed granite, over which stone sleepers were placed eight feet apart, and wooden rails were laid thereon. These so-called "rails" were twelve inches high and six wide, and on the top iron plates three inches wide and a quarter of an inch thick were spiked. A double track was in use on the inclined plane. The gauge was five feet. It is estimated that the first cost of the road was $50,000, but its upkeep for the first few years was almost negligible.

The first car was built by Bryant at a cost of $600. Three other cars were added later. A replica of the first car made from his original drawings is still in existence. It is a four-wheeled affair, the wheels being of wood and six and a half feet in diameter. The car's capacity was about six tons. The load was supported on a platform which was suspended under the axles.

The first operation of this interesting pioneer road was described by a newspaper of the time, the *Boston Daily Advertiser*, which in its issue of October 9 says:

> "This railroad, the first we believe in this country, was opened on Saturday in the presence of a number of gentlemen who take an interest in the experiment. A quantity of stone weighing sixteen

> tons, taken from the ledge belonging to the Bunker Hill Association, and loaded on three wagons, which together weighed five tons, making a load of twenty-one tons, was moved with ease, by a single horse, from the quarry to the landing above Neponset Bridge, a distance of more than three miles.
>
> "This road declines gradually the whole way, from the quarry to the landing, but so slightly that the horse conveyed back the empty wagons, making a load of five tons. After the starting of the load, which required some exertion, the horse moved with ease in a fast walk. It may therefore be easily conceived how greatly transportation of heavy loads is facilitated by means of this road." Then comes a description of the roadbed, which has been given already, ending with: "The carriages run upon the iron bars and are kept in place by a projection on the inner edge of the tire of the wheels. The wheels are of a size considerably larger than the common cartwheel. We learn from a gentleman who has visited the principal railroads in England, that in point of solidarity and skill in construction, this road is not exceeded by any one there."

The road soon became famous and attracted many sightseers. Business became so good in that section because of it, that an enterprising native opened a hostelry on the highway, at its intersection with the tracks. A year or two later when the Baltimore and Ohio road was being promoted, a delegation came all the way from Baltimore to study this railway and take back some ideas for the construction of their own road.

A further interesting fact in connection with the Granite Railway is that it seems never to have been used for the carrying of passengers. Many years later—in 1871—the major part of its right-of-way was purchased by the Old Colony Railroad. This was rebuilt and a connection with the main line established at the Atlantic station. Passenger service between Boston and Quincy was then begun; and the same newspaper which, exactly forty-five years earlier to the day, had reported the first operation of the road, now published an account of the exercises which attended the new departure. The similarity in phraseology makes one wonder whether the same brain might have guided the pen. It reads in part as follows:

> "This line which diverges from the Old Colony Railroad at the Atlantic station and runs to Belknap Square, Quincy, and which was the first railroad constructed in America, was opened for passenger traffic on Saturday. . . . Branching off from the main line at the Atlantic station the train proceeded over a new piece of road which forms a connection with the original Granite Railway, and thence over the same to East Milton, where a hearty welcome awaited the company from the citizens assembled. Flags were displayed and much enthusiasm was manifested. A brief stop was made, during which the band played and the company inspected the fine, commodious passenger station. . . . Mr. Charles Francis Adams Jr. presided at

> the table. Mr. Lunt delivered a eulogy upon the late Mr. Bryant. Mr. Forbes responded to a sentiment to the memory of his kinsman, Thomas H. Perkins, who furnished Mr. Bryant with the capital to build the original railway."

On October 7, 1926, at the town of Milton, through which the original route passed, a most interesting celebration was held. It marked the centennial of this, the first railroad in America, and among the speakers of the day were Governor Fuller of Massachusetts, various officials of the New Haven road and the president of the Granite Railroad, which is still doing business at the old stand. When most of the road was disposed of to the Old Colony Company, that portion which ran to the quarries at the Quincy terminal was retained by the quarry company. In addition, a short stub of the original line running from the wharf to the present New Haven line has also been retained by the quarry company. Thus the Granite Railroad has the enviable distinction of being not merely the original road, but also the oldest in continuous service.

An additional incident in connection with this old road should be noted. It was the scene of the first railroad accident in New England, and possibly in this country. In July, 1833, six years after the road was established, a party of four men from Boston, who had come to Quincy to inspect the road, were allowed to ride on one of the empty cars returning up the inclined plane. When a part of the way up, the chain broke, the car ran away, and the men were thrown over a cliff thirty or forty feet high, one being killed outright and the others seriously injured.

In 1895 the New Haven road acquired the Old Colony, and thus fell heir to both these pioneer routes.

The second primitive railroad, or, more properly speaking, tramway, was a product of Pennsylvania and was built in the year following the Granite Railway. It was called the "Switch Back Railroad," and was born of a necessity of getting anthracite coal from Carbon County to Philadelphia.

In 1791, a backwoods hunter by the name of Philip Ginter accidentally discovered this coal on the summit of Sharp Mountain, nine miles west of Mauch Chunk, while returning from a day's hunting. Dusk was approaching as he plodded through the forest in a drizzling rain. Stumbling along his foot struck against a loose black "stone," which attracted his attention on account of its color. Picking it up and examining it, he decided it was the substance called "stone coal" by some of his neighbors, who knew of its combustible properties and had a tradition that it was to be found in this region. He took pieces of his find along with him, and other people became interested—so much so, that within a few months the Lehigh Coal Mine Company was formed, which quietly acquired some 8,000 or 10,000 acres of unlocated land.

Small quantities of the new fuel were taken out of the mines during the next twenty years, but only in a desultory way; for one reason, the difficulty of transporting it was great, and, for another, people had not yet learned how to use it. In one test where it was put under a boiler, it only put the fire out.

Bituminous, or soft, coal was being imported from England, until the War of 1812 resulted in its stoppage. Some local men thereupon petitioned the state legislature to improve the Schuylkill River, in order that the native hard coal could be brought to the city; but upon the assertion of a senator that the so-called coal was only a kind of black stone which would not burn, the assistance was not granted. Despite this setback the promoters loaded five "arks" with anthracite, in 1813, and undertook to float them down the river from Mauch Chunk to Philadelphia, but only two of them succeeded in arriving at their destination.

Four years later, a curious lease was given by the holding company to another group of promoters, who took over the mines for a period of twenty years, the conditions of the lease being that a yearly rental of one ear of corn was to be paid on demand.

Later the legislature authorized this new company to improve the Lehigh River as a means of getting their coal to market. The Lehigh Navigation Company was thereupon formed, in 1818, and while it set about dredging the stream, another organization, the Lehigh Coal Company, took up the task of building nine miles of wagon road from the mines to the river. That same fall the road was laid out, and it is claimed that it was the first surveyed by a level. The next year the road was finished, as a wagon track, the intention being that as soon as business conditions would warrant, wooden rails would be placed on the foundation. Meanwhile, horses were used, one pair hauling from four to six tons in two wagons. In a few weeks, a total of 375 tons of coal was mined and shipped to Philadelphia, glutting the market, as its general use had by no means been attained. It required, in fact, ten more years of struggle before anthracite began to be mined with profit.

The boats used for its transportation on the Lehigh were little more than huge, unwieldy boxes, or "arks," steered by long oars, or sweeps. Once down at the city wharf, it was impossible to get them back upstream, so they were demolished, the lumber sold, and the iron work returned overland to Mauch Chunk, a distance of eighty miles. By 1831, the business had increased to such an extent that, it is stated, had the boats for that year been joined together end-to-end they would have formed a floating bridge thirteen miles in length—truly a profligate waste of lumber.

By this time, however, it had been borne in upon the minds of the company that a tramway with rails was a necessity; so in January, 1827, construction was commenced, and by May the first cars were placed upon it. They ran by gravity from the mines down to the river, and the "empties" were hauled back to the summit by mules; the said mules riding downhill in state in their own cars. The story is told

New York had just opened up the Erie Canal, and that port thus linked up with the inland lakes was coming to the front by leaps and bounds. Philadelphia, through the far-sighted and indefatigable efforts of John Stevens of "Pennsylvania" fame, who for several years had been hammering, in season and out of season, for a railroad to extend to Pittsburgh and eventually into "the heart of the extensive and fertile state of Ohio, and also to the great western lakes"; Philadelphia, we repeat, seemed in a fair way to capture an increasing share of the seaboard business, as more and more people came to accept John Stevens' point of view.

While the famous National Road, a highway extending westward across the Alleghenies, could not fail to be of some benefit to Baltimore, some of the more progressive merchants there foresaw its doom, with the advent of improved waterways and the embryonic railway. Clearly, something had to be done; so, in 1826, we find a coterie of leading citizens holding informal meetings to discuss ways and means. A proposition looking toward the construction of a canal was turned down, upon the natural grounds that the eastern terminal of such a waterway would be Washington, while the cost westward beyond Fort Cumberland through the mountains would be prohibitive.

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IV

THE BALTIMORE AND OHIO RAILROAD

When we come to the Baltimore and Ohio Railroad, we reach one of the very oldest in the point of continuous service. This road likewise has the enviable distinction of being the only railroad in the United States still doing business under its original charter, and under practically the same name as at its founding. Unlike its contemporaries—with but one exception, the Pennsylvania Railroad,—its founders were men of national vision and did not put any fixed limit or set of terminals in its plans. From Baltimore reaching out to the west as far as the Ohio, at the very least,—that was their vision. And be it understood, the Ohio was then many leagues further away than it is nowadays.

The Baltimore and Ohio road came into existence as the natural result of a far-reaching ambition of a group of hard-headed business men of that city, one hundred years ago, to place their seaport at the top of American trade, and keep it there. For fifty years following the Revolution, Baltimore had been one of the leading ports of young America; but with the end of the first quarter of the nineteenth century, rivals at the north threatened to outdistance it, and Baltimore capitalists realized that something drastic had to be done.

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About this time one of their number, who was later to be elected president of the Baltimore and Ohio corporation, received a letter from a brother in England, who enthusiastically described the successful operation of the Stockton and Darlington Railway. Although this road was hauling freight only, the writer went on to say that another line was being built for passenger service as well.

"Why cannot we open up such a line in America?" asked the recipient of this amazing letter of his colleagues.

"Why not, indeed?" they echoed; and then and there the Baltimore and Ohio Railroad was born.

On February 12, 1827, a group of some twenty-five merchants and bankers held a preliminary meeting and after much animated discussion appointed a committee to go into the matter of a railroad and report one week later. The committee reported promptly and enthusiastically, in their turn. According to their judgment, a "double Rail-road" should be constructed between the city of Baltimore and a point upon the Ohio River, at the earliest possible moment and by the most direct route available. The committee further recommended that the state legislature be importuned for a charter to incorporate the road, to be known as "The Baltimore and Ohio Railway," and at a capitalization of five million dollars.

In *these* days, parenthetically speaking, we are so accustomed to speaking and thinking in millions, that it is difficult for us to realize the magnitude of the project outlined by that little group of a century ago. They had both vision and courage of high order.

And furthermore, with consummate shrewdness and practicality, a legal draft of the charter had been already prepared and was read before the body. Things seemed to be moving too fast for one of the promoters, and he interrupted the attorney who was reading the tentative draft.

"Stop, man!" he said. "You are asking for more than the Lord's Prayer!"

"All this is necessary," replied the attorney. "The more we ask for, the more we'll get."

"Right, man; go on!" fairly shouted the now enthused heckler; and the reading proceeded.

As a result, McMahon, the attorney for the company, took his petition to Annapolis, and on the 28th of the same month the charter was granted, with one slight change; the company was incorporated as "The Baltimore and Ohio Railroad Company," in common with the practice in America, as differentiated from the English "railway."

However, the charter granting could not stop here, since other states must be traversed in the construction of the road. Virginia was next approached and confirmed the charter promptly; but Pennsylvania, for some reason, did not approve it until a year later.

The next step was the disposal of the stock of the new corporation, which proved to be easy. Baltimore was railroad mad. So well had the scheme been boomed that within twelve days—the time allotted to the sale—the 15,000 available shares were subscribed for three times over; and the nice problem which now confronted the promoters was the diplomatic apportionment of shares among the various subscribers.

On April 24, 1827, formal organization was effected. Philip E. Thomas, who had been a prime mover, was elected president; and his banker associate, George Brown, treasurer. The Board of Directors was composed of twelve good men and true, one of them being the venerable Charles Carroll of Carrollton (one of the "Signers" of the Declaration of Independence) who, despite his advanced years, took an active interest in all the proceedings. And it was Carroll who, when the cornerstone of the new road was laid, July 4, 1828, vied with the Masonic fraternity in doing the honors of the occasion. The old man, now ninety-one years of age, "broke the ground" for the future great highway of steel. Then the Grand Masters of three states took charge of ceremonies. As an interesting aside, Charles Carroll was one of the staunchest of Catholics, and the fine spirit shown on that memorable day by both Carroll and the Masons in fraternizing might well be emulated even to-day.

The breaking of ground and laying of the cornerstone took place upon the farm of James Carroll, a relative of the "Signer," on Gwynn's Run. Preceding it, a huge parade was held, in which were floats representing industries of every sort, from the farmers and gardeners to the brewers and cobblers. Five thousand marchers were in line, and fifteen times that number viewed the procession.

In speaking of the occasion, Charles Carroll said:

"I consider this among the most important acts of my life, second only to my signing the Declaration of Independence, if even it be second to that." And we can but wonder what were the inmost thoughts of the venerable statesman as he contrasted the events of this July the Fourth with that other, fifty-two years before.

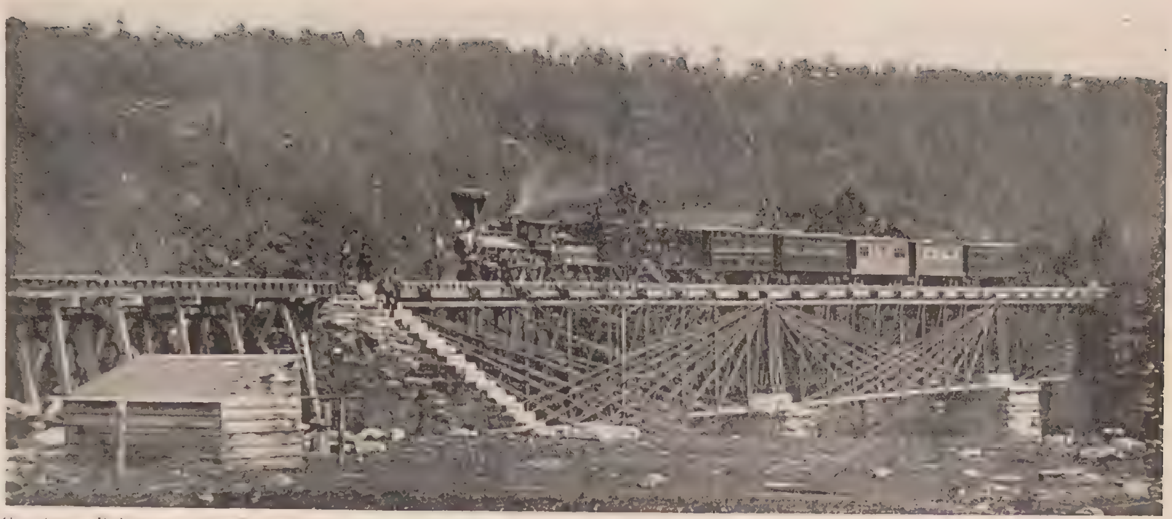
Meanwhile the surveying and grading of the road was actively proceeding westward. The average cost for the first few miles was found to be $17,000 per mile, which included the building of necessary bridges. As the construction proceeded farther west and encountered larger streams and mountains, the cost and difficulties increased. Facing one serious engineering problem, it looked for a time as if the road were stopped, but through the efforts of Alexander Brown, the father of the road's treasurer, the original plans were changed. That he was a friend in time of need is shown by a recent publication of the company, which says that when the road "had come to one of its frequent financial impasses," it was Alexander Brown who helped to raise a very necessary $200,000 to keep the work from ceasing entirely.

It was the original intention to use horses as the motive power, which would necessitate inclined planes to proceed over the heavy grades. The horses would be detached from the cars at the foot of a grade, and the cars would then be drawn up by means of heavy cables attached to windlasses, the latter in turn being moved by the faithful animals.

Other experimental roads at this time were trying out stationary engines at such points; but it must be remembered that all these pioneer companies were still groping in the dark so far as motive power was concerned.

By the following January part of the road was graded and several miles of track were laid. Naturally such a phenomenon could not pass unnoticed, and another celebration was accordingly held. So we find Postmaster General Barry a member of a party of twenty-four who were conveyed in state from the eastern terminal, Mount Clare, to the Carrollton Viaduct, about a mile. They rode in a flanged-wheel carriage, a horse furnishing the power.

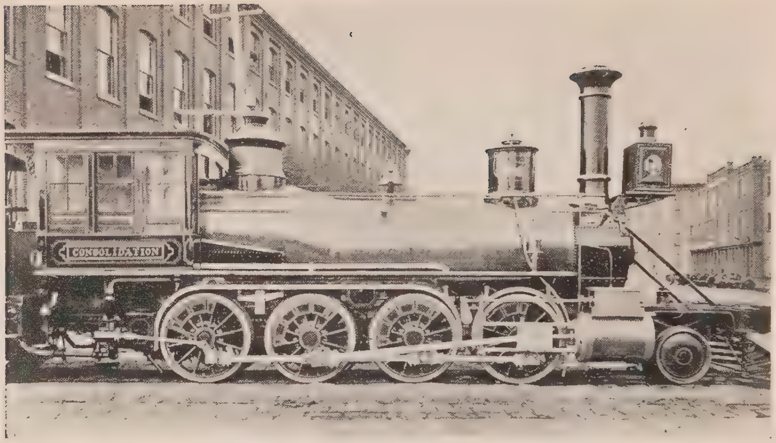
The success of this venture settled definitely in the minds of some the question of motive power. Horses had been used since the dawn of civilization; they were good enough for them. But others doubted. A brother of President Thomas had sent a glowing report of a demonstration of his pet theory, a wagon propelled by sails. A car was accordingly fitted up with a large sail, and after it had been hauled up grade to the Viaduct, they waited for a propitious breeze, and back it sailed in grand style. But could they always afford to wait for a breeze? Next a treadmill car, with a horse on deck patiently demonstrating this method of applying power, was tried out. It worked fairly well until one day when the horse became annoyed at sight of a cow on the track ahead, and tried to run away. In the resulting smash-up several passengers were injured. So the



Courtesy Baltimore and Ohio Railroad

THE FIRST TRAIN ACROSS THE ALLEGHENIES

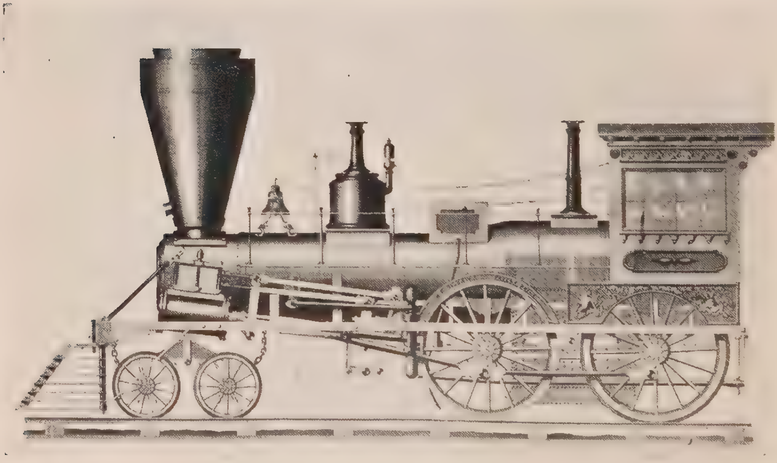
A type of the fifties, also showing trestle construction



Courtesy, Baldwin Locomotive Works

"CONSOLIDATION" TYPE OF LOCOMOTIVE

A popular type in 1866



Courtesy, Baldwin Locomotive Works

AN EVOLUTIONARY TYPE

Design of a Baldwin locomotive built during the early fifties time-honored method of horse-drawn vehicles was resorted to and maintained for some months. Some seven miles west of Baltimore where steeds were changed, a station was established called "Relay"—and it is still doing business under that name.

Certain progressive spirits, nevertheless, were not satisfied. Peter Cooper, of New York, was one of the pioneers in the use of steam, and he agreed to build a trial locomotive. This he did after several months of labor in the car house at Mount Clare, and at last pronounced it in running order. August the 28th was the date set for the big journey. The directors and a few select friends were present, as the engine was to haul but one car. It was the diminutive "Tom Thumb," already described in these pages, and even its most ardent supporters looked doubtful as the "tea-kettle on a truck" was run out and attached to its car. Only Cooper smiled serenely. His faith was justified. The little machine lost little time in getting into action; and it actually ran out to Elliott's Mills, fourteen miles, in an hour and a quarter. Loud huzzas rent the air. But wait, dear reader. Enter the heavy villain.

The owners of the stage-line of Stockton and Stokes were naturally not overjoyed at this innovation, which threatened serious rivalry. The railroad itself was bad enough, without adding insult to injury by placing upon it an antagonist puffing out clouds of smoke and cinders. At Relay, Peter Cooper's party noticed a car on an opposite track heading in the same direction. As they drew abreast the meaning was soon apparent. The stage-line had selected one of their best horses for the "showing up" of the new competitor, and as Tom Thumb came puffing up, the stage driver whipped up and also got under way. It was to be a race to the death.

At first the four-footed power forged ahead. Then "Tom Thumb" spat out extra smoke and cinders and coughed himself by the gallant steed. The cheer-leaders on board began to sit up and take notice; but their crowing was premature. Tom began to have troubles of his own. His belt began to slip, and although he wore no trousers, the results were just as bad. Cooper, who was acting as engineer, jumped out quickly and tried to put the belt back in place; but too late. The directors had the humiliation of seeing Tom come in second, while the rival party grinned triumphantly.

Despite this defeat, the road saw the tremendous possibilities of steam. So constantly was it urged among the directorate, that within four months the road publicly advertised for four locomotives of American make. Two were to cost $4,000 each, to weigh not more than three and one-half tons, and to haul fifteen tons on the level at the rate of fifteen miles per hour. The other two were to cost not more than $3,500 each. These prizes were dangled before the eyes of American builders on January 4, 1831, and the trials were set for June 1—not an undue amount of time.

To Phineas Davis, a hitherto unknown maker of watches in York, Pennsylvania, came the first and only prize in this contest. Working day and night on an ~~engine which he~~ christened the "York," (mentioned in our first chapter) he completed it on time, and had it hauled by oxen a distance of sixty miles over the mountain roads, and placed on the B. and O. tracks, where it successfully met every requirement. It was found necessary, however, to overhaul this engine thoroughly before it was placed in regular service. In July, however, it instituted a passenger service between Baltimore and Ellicott's Mills, running the distance easily in an hour's time. While we are not so informed, we suspect that the rival stage company did considerable gnashing of teeth.

As for Phineas Davis, in addition to his prize of ~~$4,000, he~~ won the position of Master Mechanic with the road, and was given orders to build another locomotive. This was the "Atlantic,"—previously mentioned—"a very real locomotive," says Edward Hungerford, present historian of the road, who adds that it "went into service in the summer of 1832, and continued hard at it for sixty long years thereafter." The "Atlantic" is still in existence and can run, if need be, under its own steam—a remarkable creation indeed.

Horses, however, continued to furnish the bulk of the motive power for some months; and meanwhile, the construction of the road itself pushed steadily westward. By January, 1832, it had reached Frederick, Maryland, a distance of sixty-one miles. The operation of trains closely followed after.

In speaking of the run to Frederick in those days, Mr. Hungerford says: "It took, at that time, the better part of a day to cover the sixty-one miles of line. One left the lower station of the road in Baltimore, in Pratt Street, close by the inner harbor, at 9:30 o'clock in the morning; in a little time passed Mount Clare, with its bright new shops; rode over the impressive Carrollton Viaduct and, within the hour, came to the Relay House, where horses were changed and brief opportunity given to repair to the tavern for refreshments. From the Relay House the road followed the narrow, tortuous valley of the Patapsco for a number of miles. But before the Halfway House had been reached the river had long since been left behind."

The first of the inclined planes was at Parrs Spring Ridge. This was surmounted by attaching two horses to each car; but windlasses and cables were being installed, to take their place. The painful haul to the summit took extra time, and so, as Mr. Hungerford says, "if the long trains on individual and separated cars were on time, Frederick was reached by 5:30 o'clock in the evening." With an average running time of only about eight miles an hour, it is small wonder that the officials looked forward impatiently to better power and traction.

Three months after Frederick was reached, Point of Rocks loomed up. Difficulties with a canal company were experienced here. Suffice it to say that construction was brought to a standstill for nearly three years, and it was not until December, 1834, that Harper's Ferry was attained. Here the Potomac was bridged with what was regarded as one of the greatest engineering triumphs of that day.

Meanwhile, other engines were slowly coming into use. One, called the "Arabian," is on record as having drawn a passenger train for fifty consecutive days without a lay-off or repair of any sort. By 1834 the rolling stock of the company totalled seven engines, 34 passenger coaches, and 1,000 freight cars,—not a bad showing, indeed, when we remember that construction of the road was going forward at the same time.

As regards the passenger coaches, they were at first of the familiar stage type. Then Ross Winans—later of locomotive fame—contributed something worth while to all the future roads of the country, by building a new-style car of long, enclosed corridor type, with a double truck of eight wheels. Some of these were soon placed into service on the B. and O., President Thomas placing a Bible in each one of them—whether as hint or precaution, who shall say?

In 1835, the road opened an important branch line from Relay to Washington, thus giving direct rail service to the national capital. In connection with this line an interesting yet irritating condition of affairs should be noted. The state legislature had arbitrarily fixed the one-way fare at $2.50, of which one-fifth was to be returned to the state by virtue of a subsidy of half a million dollars granted the road at the time of its incorporation. This Damoclean sword hung over the head of the road for a third of a century, and actively threatened its destruction in the financial panic which swept the country in 1837. Scores of other railroad projects succumbed, only the hardiest weathering the storm. Among the latter, the Baltimore and Ohio was conspicuous.

As the present sketch is concerned only with the opening years of the road, we must forego mention of many interesting incidents of its later, prosperous years. All who were privileged to attend the "Fair of the Iron Horse"—as did the present writer—which was held in Baltimore in 1927, to mark the centenary of the road, could not fail to have been profoundly impressed with the enormous strides made in railroading in the past one hundred years; and to which the Baltimore and Ohio contributed a notable share.

V

THE EARLY VICISSITUDES OF THE ERIE

As early as the first administration of Washington, a petition was introduced into Congress to construct a great road reaching from the Hudson River across the southern borders of New York to the shores of Lake Erie. It was to be known as the "Appian Way." One of its sponsors was General James Clinton, father of the famous DeWitt Clinton, many times governor of New York, and godfather of the Erie Canal. The Canal, opened for traffic in 1825, pierced the northern tier but left the southern untouched. A second canal was agitated, as well as the "Appian Way," but neither of them was authorized by Congress.

There was one far-seeing individual, however, who refused to let the matter drop. He had certain ideas of his own, which he aired in a pamphlet with the descriptive title of:

> "Sketch of the Geographical Route of a Great Railway, by which it is proposed to connect the canals and navigable waters of New York, Pennsylvania, Ohio, Indiana, Illinois, Michigan, Missouri, and the adjacent States and Territories, opening thereby a free communication at all seasons of the year between the Atlantic States and the great valleys of the Mississippi."

This man, whose prophetic vision placed him far in advance of his time, was William C. Redfield. He has been called the "Father of the Erie," as the route he then expounded was later followed in general.

Redfield was an early scientific writer of note, and first president of the American Association for the Advancement of Science. His pamphlet showed his thorough familiarity with his subject. He gave nineteen different reasons why railroads were preferable to canals. He further stated it was his belief that "this great plateau will indeed one day be intersected by thousands of miles of railroad communications, and so rapid will be the increase of its population and resources, that many persons now living will probably see most or all of this accomplished." How true a prophet he was is instanced by the fact that when the Rock Island Bridge was opened, in 1854, Mr. Redfield was an honored guest.

His pamphlet was widely circulated and read soon after its appearance, in 1829. Two years later its seeds began to bear fruit. President Jackson, himself an ardent advocate of internal improvements, appointed a son of Governor Clinton, a member of the U. S. Army Engineer Corps, to go over the proposed route as far as the Mississippi. His report, while superficial, demonstrated the feasibility of the project.

While thirteen roads had been chartered by New York, from 1826 to 1831, the latter year witnessed a veritable orgy of promotion. The legislature was besieged with applications, among them one from a group wishing a charter for "The New York and Erie Rail-Road Company." It proposed to construct a railroad "from the city of New York through the Southern Tier of counties and the village of Jamestown to Lake Erie." The charter was granted on April 24, 1832, and after a hard struggle the company was duly organized, August 9, 1833, through the sale of the stipulated one million dollars worth of stock. However, but five per cent. of the capitalization had been paid over, instead of the ten originally stated in the charter, which gave the new company but $50,000 in actual cash. The promoters thereupon decided that no funds would be spent "unless extensive and valuable donations of lands and money from the proprietors and inhabitants on or near the route are made to the company." Although considerable land was acquired in this way, the impression got abroad that something underhand was being done.

The promoters, headed by Eleazar Lord, the first president, were meanwhile active in other directions. State aid was asked, and after considerable wrangling the incommensurate sum of $15,000 was granted for a preliminary survey. Congress was next petitioned to grant the company two million acres of public lands, in return for which the road agreed to carry the mails for thirty years without charge. While Congress rejected the petition, it is worthy of note that this was the first suggestion made in this country, and possibly any other, as to the use of the new means of transportation for carrying the mails. Furthermore, the sale of public lands was later employed successfully in the promotion of railroad building.

The company, meanwhile, had made a gesture in the way of actual construction. On November 7, 1835, just three and a half years after the New York and Erie was chartered, the first ground was broken. It was near Deposit, a town on the Delaware River, a few miles east of Binghamton. Hard upon the heels of this ceremony came many troubles. The two prime movers were Eleazar Lord and James Gore King, a New York financial power. They differed radically on many points, and first one served as president and then the other.

In 1837 our first great panic occurred. King was sent to England by Wall Street to solicit aid in stemming the tide of bankruptcy which threatened banks and other institutions all over the country. While he was abroad, Lord applied to the state legislature for a loan, which was entirely contrary to King's ideas, the latter being a strong advocate of state ownership, as he believed that in no other way could the project be completed.

While Lord was an energetic man, some of his energies were misdirected. He advocated and put through his plans for a six-foot gauge, when the four foot, eight and a half inch gauge was being used by most of the other roads. His monumental folly was in the substitution of a system of driven piles for the usual graded roadbed, already alluded to in an earlier chapter. Nearly a hundred miles of piling was driven along the proposed route, on which no track was ever laid, and at an estimated expenditure of from half a million to a million dollars—a huge sum in those days, and enough to have put the struggling road under the soil for all time. This monument to "Lord's Folly," as it was called, could be seen for many years after the road was in operation.

State aid was importuned in 1837, futilely, and again the next year, with success. In 1839, also, favorable legislation was enacted, but hardly had the management adjusted itself to a new and better day, when it had to face a "whispering campaign" directed against its officials. Lord in an open letter to the legislature asked for an investigation, which he got. The report absolved the management from any wrong-doing, but the campaign of vilification was kept up, and Lord resigned.

Backed by state aid, actual construction had progressed rapidly from the spring of 1840. By June 17, 1841, rails had been laid as far as Ramapo and on that same day a trial trip was made from Piermont, the eastern terminus, to Ramapo. From the outset steam power had been decided upon, and the locomotive placed upon the rails was christened the "Eleazar Lord."

On June 30 the first trainload of passengers was conveyed over the new road. They went by steamer from New York up the Hudson to Piermont, where the pioneer passenger train was waiting. It made the run from Piermont to Ramapo in 65 minutes. In speaking of this ride one of the passengers said that "the heaviest locomotive ever built, as we are informed, is that which was used on Wednesday, and with which we passed up a grade of 60 feet to the mile, the distance of four miles, at the rate of ten miles an hour."

After some further delay due to financial difficulties, the next section of the road was opened to Goshen, the event being the occasion of great celebrations, on September 23, 1841. A tremendous crowd had assembled from many miles around, and much feasting and speech-making were indulged in. A special train of officials and guests included Washington Irving, the author, and the two trains of four cars each used for this trip were so overloaded "with human beings as to press the woodwork down upon the wheels, the flanges of which ground into it at every revolution. But in spite of this, which would be more than enough to start a panic among a railway excursion party to-day, the excursionists seemed to have had a most enjoyable trip." The Erie, unwittingly, was setting the example of overcrowding its coaches, so successfully and consistently followed by many traction companies ever since.

An amusing incident is related of a farmer living on the route from Goshen to Middletown, the next step in the westward journey. The road traversed his land and it had also purchased timber from him. As he had been unable to collect for either claim, he took the law into his own hands. After the road had been opened for traffic and a train was approaching his right of way, the engineer observed that a rail fence, four rails high, had been built squarely across the track, and that the doughty farmer was lying on a cross-tie. When the train-men brought the cars to a standstill and went forward to see what it was all about, the farmer calmly explained that until settlement was made, the railroad couldn't run trains through his farm, by heck! Arguments and threats were of no avail. The engineer even went so far as to run the engine almost upon the prostrate man, blowing steam into his face, but to no effect. Finally the crew forcibly detached him from the cross-tie, which he had been stoutly embracing, put him aboard the train, tore down his fence, and proceeded on their way. His action had the desired effect, however, as shortly after an agent of the road called at his house and settled the account in full.

Goshen was the western terminus of the road for almost two years. "The heavy hand of misfortune" was laid upon it, in the words of one writer, and a "hand-to-mouth" existence must have been the sort that its perplexed directors led. Yet a rich farming country was gradually being tapped, and if the road could only hold out long enough, profits were certain to accrue. For instance, the first shipment of milk by rail that ever entered New York City came over the Erie. It was a consignment of 240 quarts in the pyramid churns of the period, and came from Orange County by rail to Piermont and thence by boat to the city. The innovation was so much a success all around that, within a few months the *Goshen Daily Republican* reported that "fifty dollars a day is being received by the railroad as freight on milk. This would give the working days an income of nearly $16,000." By 1842, in fact, the milk shipments had reached a total of between six and seven hundred thousand quarts during the year; and the following twelvemonth showed an astounding total of four million quarts. A great industry had been established, bringing profit to the farmer as well as the carrier.

Middletown was reached on June 7, 1843, and in turn remained the farthest west for over three years. There were still dark days just ahead and many of them. For several years no official report was made. When finally in 1849 it was given out, it stated that "the condition of the road is such as hardly to permit a train of cars to pass over it with safety. . . . Miles of road standing on piles, and high trestlework in a decayed state, which had to be filled up, requiring in many cases very expensive culverts, with long and heavy embankments."

Mr. Mott, a historian of the road whom we have previously quoted, gives an interesting account of the origin of reduced fares to clergymen. A Presbyterian minister residing in Goshen had been in the habit of going to New York once or twice a week, and happened to be on a train returning from Piermont when the train became stalled, due to frost coming out of the ground and ruining the track, after a hard winter. The passengers, however, held an indignation meeting and drew up a condemnatory paper which was passed around for signatures. When it reached the clergyman he suggested a preamble putting the chief blame upon Jack Frost. His stand squelched the document, and the gratified conductor of the train resolved never to take another fare from him—passengers at that time paying their fare directly to the conductor. The minister thereupon suggested that all his brothers of the cloth be absolved from payment of fare. The officials consented to this and free passage was given them for several years, after which a half-fare system was adopted.

All this time the road had been following its original gauge of six feet, although the narrower, standard width was strongly advocated by their chief engineer, Thompson S. Brown. As the change would necessitate the rebuilding of their entire eastern division, and new rolling stock, the officials continued for some years longer with the six-foot gauge. "This short-sighted decision," says Mott, "cost the company more than twenty-five million dollars before it was forced to the conclusion that Major Brown's contention was right, and the track was narrowed to the gauge he had advocated nearly forty years before."

In the construction of the stretch of track to Port Jervis another financial snag was encountered. The line followed the west side of the Shawangunk Mountains, and the promoters saw a chance to get land which had been practically worthless at a low figure. But shrewd farmers in the Neversink Valley had anticipated this move. They got hold of the land and held it at such exorbitant prices that the company decided to leave it alone. They did, however, purchase timber for the right of way. As for the slick farmers, their Nemesis was at hand. The contract labor was mostly Irish and, on Sundays when no work was going on, these laborers swarmed by the hundreds over the adjacent farms, stripping apple orchards, potato fields, and everything else edible as relentlessly and thoroughly as seventeen-year locusts.

The forties saw many dark days for the road. A three-million dollar state loan had been exhausted; the road defaulted interest charges amounting to $41,000; and the Comptroller advertised it for sale. The legislature intervened and held up the day of reckoning for six months. It was also a political issue in the state in the campaign of 1842. The legislature was finally persuaded to postpone the sale of the road until 1850, with the proviso that construction be resumed, and that a single track be in operation to Lake Erie by that time. The company was further authorized to issue bonds for an additional three million dollars. This should be an absolute lien on the property, but the state would hold itself responsible for the payment.

In this crisis the first practical railroad man to show his head in Erie affairs came forward, in the person of Horatio Allen—a man who should ever loom large in the history of pioneer American railroading. One of the then directors said, many years later: "We were building a railroad that was to cost millions, and we hadn't money enough to buy candles. There was positively not one cent in the treasury. Every director in the board had endorsed for the company up to the last dollar he was worth. There was no gas in those days, and we used to pass a hat around among us, to get money to pay for the candles which lighted us at our work."

Things dragged along. The new president with admirable aggression tried several plans for raising money, but they all fell flat. Then he and his whole board resigned, and the ever-present Lord was chosen for the third time to head the road's destinies. This time he did not last a year. He was defeated on a question of policy, and Benjamin Loder, a dry-goods merchant of New York, was chosen to succeed him. Under his business-like administration things changed for the better. The three million dollar loan, which had been authorized, was floated, and again the sound of pick, shovel, and sledge-hammer was heard in southwestern New York. By May, 1851, the road was formally opened as far as Dunkirk.

Through various vicissitudes the road slowly but steadily pushed westward. The region through the Delaware Valley was almost a wilderness, and peopled largely by frontier folk who did not come in contact with the outside world. Amusing tales are told of natives who, hearing the whistle of the locomotive for the first time at a distance, took it for the cry of some wild animal. One party of hunters, on hearing this far-distant screech, assembled their dogs and fire-arms, and after following the strange sound excitedly for miles over the unbroken country were much chagrined to come up with their quarry standing quietly on the railroad in front of a new station. Another hunter, living across the state line in Pike County, Pennsylvania, set his traps for a whole month to catch the uncanny creature, whom he could hear through the forests at night, but never could set eyes upon. His feelings when one day he both heard and saw it gliding along a path of steel may be imagined.

The town of Binghamton, New York,—two hundred miles west of New York—received a Christmas present in the form of a railway, in 1848—the section from Deposit having been completed by December 27. There is still on record a report of a wild ride made on and around Christmas on the part of an advance party who took an engine, a coach, and two flat cars over the line to see if everything was shipshape. It was not. In two places the track was missing for two or three miles, and a part of the crew had to be sent back for rails. A heavy snowstorm set in and soon the track was covered to a depth of six or eight inches. Six miles out of Narrowsburg the locomotive ran out of water. There was a creek thirty feet below the roadbed, so a line was formed and hundreds of pails of water passed up to fill the tank, during which operation several of the men froze their fingers. They were marooned all one night and had a hard time foraging food the next day. The mercury was down to zero when they finally struggled into Deposit. There another engine was waiting them, but as the engines in those days were without cabs or other shelter, they faced a strong northwest wind in the bitter cold for forty miles. Binghamton was finally reached at half past eleven at night, the entire journey having required "three days, nine hours and a half in getting over the division." But the scouting trip had borne fruit. "We succeeded in getting the road in order so that the excursion train on the following Wednesday passed over the division without accident or delay."

It is stories such as this which reveal the hardships undergone by the pioneer roads, less than a century ago.

One handicap which we have not yet dwelt upon, but which was very real, not only for the Erie but for all the early roads, was the antagonism of the canal companies. The latter tried by fair means and foul to hinder the progress of this formidable rival. In 1845, for example, when the Erie tried to secure from the Pennsylvania legislature a right of way through Pike County, they were balked by the Delaware and Hudson Canal Company. Later, however, the charter was secured. In this connection it is interesting to note that, during the forties, the Erie had two schedules of rates, one listed as "special," which lasted from the first of April until the "close of the river"; the other, a regular and higher rate, was in effect until the ice could be cleared. In other words, the "special" rate was made in order to compete with the canal and river companies and "get theirs while the getting was good."

We have already spoken of the Erie as an important factor in developing the up-state milk industry. In 1846 a strawberry train was put on between Suffern and Piermont, and, the very first season, transported 400,000 baskets of berries to market. The next year this remarkable figure was increased.

On April 19, 1851, the last spike was driven at the town of Cuba, thus making a continuous track between the Hudson River and Lake Erie—some sixteen years after the first dirt had been shovelled. The line was formally opened to Dunkirk in May of the same year. Just previous to the opening run, a special was sent over the road, and, like the trial run to Binghamton, already mentioned, had its own troubles. A stop overnight was made at Elmira. The next day, a construction train working at Tip-Top Summit was seen to disappear with the track in a swamp. Down the engine went until it was almost entirely submerged. It took a week to raise it, a track meanwhile having been built around the bog.

The opening at Dunkirk was celebrated with much éclat. The President of the United States, Millard Fillmore, was present, with several members of his cabinet. The assembled crowd of noisy enthusiasts called long and loud for the beloved orator, Daniel Webster, then Secretary of State, for a speech. But his great peroration at Bunker Hill was not to be duplicated here; indeed, he did not at first put in an appearance at all. Finally, after a further riotous demonstration, he came forward, "haggard and dishevelled," pleading fatigue and illness. Some of his detractors claim that his disability that day was due to too much conviviality the night before. Howbeit, he recovered in a day or two, after the rest of the official party had gone home without him, and made partial amends by delivering a speech which lacked nothing of its accustomed vigor. The only trouble with it was that—like some train schedules—it was "twenty minutes late."

While all the early roads experienced difficulties, it seemed as if a special "jinx" pursued the Erie. Bad floods and deep snows continually hampered traffic. During the fifties, there were several record snowfalls of from three to six feet. In 1852 the drifts near Dunkirk were thirty feet high, and it is said that passenger trains were stalled for a week at a time. On one occasion a force of ten locomotives and five hundred men were required to keep the track clear. On one run in the winter of 1855 a train hauled by five engines was nine days in traversing this division.

Besides this, there were labor strikes, rate wars, and ever-recurring financial stringencies. Down on Wall Street the road was made a football, with Drew, Gould, Vanderbilt, and Fisk by turns taking a hand in the game. With these later years and financial problems the present sketch is not concerned. Suffice it to say that out of a receivership of the old New York and Erie Railroad, the modern Erie Railroad was born, with its double-track of excellent rails extending all the way to Chicago. And even on the stock market it is gradually coming into its own.

VI

THE NEW YORK CENTRAL RAILROAD

One August day in the year 1831 a curious scene might have been witnessed at the little town of Albany, New York. A railroad fifteen miles long had been built as far west as Schenectady, and, according to announcement, an excursion train was to be run. Furthermore, and more exciting still, it was to be drawn by one of those new-fangled steam-locomotives, which was called the "DeWitt Clinton."

William H. Brown, a famous silhouette artist of the time, was a passenger on that momentous trip, and has left a graphic account of it, which we cannot do better than follow. He speaks first of the tribulations of John T. Clark, "the first passenger railroad conductor in the North, stepping from platform to platform outside the cars. When he finished his tour he mounted upon the tender attached to the engine and, sitting upon the little buggy-seat, he gave the signal with a tin horn, and the train started on its way.

> "But how shall we describe the start, my readers?" continues the facetious Mr. Brown. "It was not that quiet, imperceptible motion which characterizes the first impulsive movements of the passenger engines of the present day. Not so. There

came a sudden jerk that bounded the sitters from their places, to the great detriment of their high-top, fashionable beavers, from the close proximity to the roofs of the cars. This first jerk being over, the engine proceeded on its route with considerable velocity for those times, when compared with stage-coaches, until it arrived at a water station, when it suddenly brought up with a jerk number two, to the further amusement of some of the excursionists. Mr. Clark retained his elevated seat, thanking his stars for its close proximity to the tall smoke-pipe of the machine, in allowing the smoke and sparks to pass over his head.

"At the water station a short stop was made, and a successful experiment tried, to remedy the unpleasant jerks. A plan was soon hit upon and put into execution. The three links in the couplings of the cars were stretched to their utmost tension. A rail from a fence in the neighborhood was placed between each pair of cars and made fast by means of the packing-yarn for the cylinders, a bountiful supply being on hand. This arrangement improved the order of things, and it was found to answer the purpose, when the signal was again given, and the engine started.

"In a short time the engine (after frightening the horses attached to all sorts of vehicles filled with the people from the surrounding country, or congregating all along every available position near the road, to get a view of the singular-looking machine and its long train of cars; after causing thus innumerable capsizes and smash-ups of the vehicles and the tumbling of the spectators in every direction to the right and left) arrived at the

Courtesy, New York Central Railroad

JOHN B. JERVIS

A pioneer among Railroad construction engineers, and one of the ablest men in the history of railroading

Courtesy, Pennsylvania Railroad

JOHN STEVENS

Called with some justice the "father of the American Railroad system"

Courtesy, New York Central Railroad

THE "HUDSON" TYPE LOCOMOTIVE

For use in hauling the "Twentieth Century Limited" between New York and Chicago head of the inclined plane at Schenectady, amid the cheers and welcomes of thousands assembled to witness the arrival of the iron horse and its living freight."

This little fifteen-mile stretch of track, known as the Mohawk and Hudson Railroad, was the progenitor of the famous New York Central of a later date. The pioneer company was incorporated, April 17, 1826, "for the purpose of constructing a single or double railroad or way betwixt the Mohawk and Hudson Rivers." Nothing was said at the time about the kind of power to be employed for traction, and doubtless the promoters had not arrived this far in their plans.

The original project seems to have been due to a certain George William Featherstonehaugh, a Londoner by birth and Oxford graduate, then residing in Schenectady County. He owned a large estate and was a gentleman farmer, but became intensely interested in railroads, making a special trip to England in the latter part of the year, 1826, to study the experimental roads there. With him went Peter Fleming, a civil engineer in the employ of the newly-formed railroad company. For two years thereafter, Featherstonehaugh was active in working out details for the new road, but, meeting with financial reverses of his own, was then forced to lay it aside and remove to Philadelphia.

Fleming also was superseded, by John B. Jervis, a leading engineer of the period; and under the latter's oversight the first ground for the road was broken, in 1830. The original route did not follow the line of the present New York Central. On account of the rugged topography, each of the terminals, Albany and Schenectady, was provided with an inclined plane and stationary engine. The steam locomotive was in its infancy, and there was no means of telling just how much of a load, or how steep a grade, one of these crude contraptions could pull with certainty.

As for the roadbed, not much difficulty was met with in constructing a fairly level track; the highest fill being forty-four feet, and the deepest cut, forty-seven feet. The track was not unlike those described in an opening chapter, with a stone pathway between the "rails" for the use of horses. The use of horses was specifically authorized in the company's charter, but not exclusively so, as the officials began their active investigations of steam power as soon as they began to lay track. A statement of operating expenses for five months in 1831 shows a total expenditure of nearly $7,500, the larger part of which went for "horse-power."

It was at this time that Chief Engineer Jervis entered negotiations with the West Point Foundry for a trial locomotive. The famous "DeWitt Clinton" was the result, an odd-looking but successful machine which we have already described.[1] Hitched to a train of cars which looked like stage-coaches, it gave a phenomenal run, on August 9, 1831, for the edifica-

[1] See page 6

tion of Mr. Brown and his friends, reaching a speed of fifteen miles per hour. The engine, however, developed serious mechanical difficulties, and was laid up for repairs. Since the road had been built at first for passenger service only, not a wheel was turned for several months, or until April, 1832.

The second locomotive used by the Mohawk and Hudson road—as previously stated—was of English make. It was christened the "Robert Fulton," but was promptly nicknamed "John Bull." It was of heavier type than the "DeWitt Clinton," but also proved more durable, and still further convinced the management that it was on "the right track" in making use of steam in preference to horse-power. Yet as late as 1839 the records show that while locomotive-power cost over $5,750, horse-power cost over $10,000.

Meanwhile, the subject of inclined planes was causing the officials no little worry. They were expensive and cumbersome, that one at Schenectady costing $10,000 a year to operate. Yet when the company announced its purpose of discontinuing the planes, a storm of protest followed, chiefly from citizens of Albany. Indignation meetings were held, and so lively were they that when the company was invited to a parley, one of its directors retorted: "While you invite the company to an interview and a friendly meeting . . . the company . . . is assailed by the other party with opprobrious epithets and all kinds of abuse, and the directors are held up to the eyes of the public as monopolists . . . I therefore would advise to defer any negotiations until the disgraceful and unnatural war waging by your citizens against the company has ceased, and an excitement raised by appealing to the passions of your working class of people has also subsided."

The popular clamor presently died down, when the true purpose of the company was apparent, and the Albany inclined plane was abolished. A new route was laid out in conjunction with a road extending from Troy to Schenectady.

Still another line running from Utica to Schenectady was opened, by another company, in 1836, and the connecting roads were faced with problems familiar enough to traffic men of a later day, but then absolutely new. The chief of these problems were a joint running schedule to make connections with trains, for the benefit of the traveling public; the possibility of through runs from Albany to Utica; and through fare rates. There was some hitch as to the proposed leaving time at Albany, on the ground that to leave at the suggested hours of eight A. M., and two P. M., "would occasion much inconvenience," as they were "the usual hours for breakfast and dinner." Eventually a compromise was effected and the through service inaugurated.

While the Mohawk and Hudson was undertaken as a passenger road, the second year of its operation found it hauling freight as well, due to an insistent demand; and the report for 1839 showed a total of over 26,000 tons of freight carried, with gross receipts of almost $26,000, or nearly one dollar per ton.

As for the Utica and Schenectady road, it was chartered on April 29, 1833, and is further of note as following practically the line of the present New York Central; and is thus one of its earliest and most important links. A little over three years after receiving its charter, the road started operations. On August 1, 1836, a party of excursionists left Albany over the Mohawk and Hudson, and was transferred at Schenectady to the new road, which had two smart-looking trains in waiting consisting of two locomotives, each hauling ten cars. It was a gala day for Utica, the celebration lasting until the next day, when a train carrying some three hundred passengers left on the return trip for Schenectady, arriving there in the creditable time of six and a half hours.

It seems to have been the practice from the outset to run these early trains on Sundays, as well as other days—which aroused considerable adverse criticism. The Utica road thereupon declared that it was "willing and desirous" to discontinue Sunday service "as soon as proper arrangements for that purpose" could be entered into with the several railroad companies and the Post Office Department. "No "proper arrangements" were evidently made, however, as, from all existing records of the New York Central, the Sunday runs were maintained.

The early operating rules for this road are most interesting, as they laid down certain cardinal principles which have remained in effect among all American roads. The first rule prescribed that "all trains going west will run upon the north track, and all trains coming east will run upon the south track, according to time-table." The second rule directed that the conductors and engineers should compare their watches daily with the office time at Schnectady, which was to be the standard time. The third specified, among other things, that no train should arrive at a regular station in advance of the specified time, and that passenger trains should have preference over freight and working trains on the road and at stations. Furthermore, "trains leaving behind time shall not run at greater speed than allowed by timetable—that is, no time shall be made up unless lost upon this road."

The fourth rule provided for a flagman, in case of a break-down, to warn trains "with a flag in the day-time, and a lamp in the night time," at a distance of at least eighty rods. The fifth outlined certain safety rules, when one train was following another. The sixth directed that engineers, "in approaching stations, switches, or cross-roads, must see that the way is clear and the switch is right. The bell must be rung eighty rods before approaching a cross-road or station, and rung until passed." The seventh rule provided for red lamps at night on the rear ends of all trains.

There were fourteen rules in all and nearly every precaution set down is in practice to-day—thus illustrating the progressive and far-seeing policy of these officials of nearly a century ago.

Another embryonic road which now constitutes a part of the Central system was the Syracuse and Utica Railroad, incorporated in 1836, and opened for business, July 3, 1839. John Wilkinson, president of this road, was a man of considerable force of character. One of his hobbies was a fight against the pass evil, every pioneer road being pestered by applicants for free transportation. Wilkinson went so far in his stand against it, that he kept a diary which recorded the number of persons day by day, who rode free. On March 10, 1846, he records jubilantly: "Not a single deadhead to-day." His contention in his annual report for 1849 that large numbers were allowed to ride free, "because of inability to pay," is amply borne out by his entries: "One poor blind man and boy"; "A poor woman in emigrant car and had a small infant"; "A very poor man"; "A poor family"; "Two exiles"; "A poor, crazy man"; "One lame man"; "Poor colored man"; "2 deaf and dumb boys"; "Six blind girls"; "Five mutes, two blind boys"; and so on—thus proving that, while these early roads had their rules, they were not soulless corporations.

However, charity passengers were by no means the only "dead-heads." Wilkinson's entries show that the State Militia officers availed themselves of the privilege, as well as editors and judges, in fact, every sort of official from Congressmen down. An entry is given of "Aaron Burr's daughter's wedding party." Indeed, the first week of his record showed an amazing total of 196 dead-heads carried on his short line, an average of almost twenty-eight a day.

His efforts brought forth fruit, however, for on July 1, 1849, the pass privilege system was changed, as he gleefully says, in his report for 1850, that "since that time the only persons allowed to pass free are the officers and men in the service of the company." Still deprecating the tendency of the system he adds: It "runs into favoritism. It is corrupting, it is not business-like, and ought not to be tolerated." In this stand Wilkinson showed himself fifty years ahead of his time.

The universal prevalence of the pass evil, which persisted until a generation ago, is further illustrated by conditions in the Middle West in the first days of railroading, and which the present writer has pointed out in his book on "Lincoln and the Railroads." No public official thought of taking a journey on any ticket save a pass. Lincoln habitually used one, and expected the privilege even after elected President. It is true that he was a prominent railroad attorney before entering the field of politics. The practice out there was called "chalking the hat," from the custom of the conductor in placing a white mark or ticket on the "stove-pipe" or other headgear of the free passenger. A letter is still extant from Lincoln to a railroad friend, R. P. Morgan, in 1856, which reads in part:

> "Acting on this precedent, I say 'Here's your old chalked hat.' I wish you would take it, and send me a new one, 'case I shall want to use it by the first of March."

Wilkinson in his reports pays his respects to other current abuses which persist to-day. He inveighed against the violation of the rule regarding the standing on the platforms by passengers, or getting off the trains while the latter are in motion. He referred to the dangerous practice of persons walking along the track. He took up cudgels against cattle-owners who allowed their animals to run at large and get on the tracks, sarcastically remarking that the parties at fault assume that the cattle "have as good right to occupy the public highway at a railroad crossing at the same moment when a train of passengers are passing them, that they have." He paid his respects to that other class of passengers who tried to evade the payment of their fare, thus compelling regulations which worked a hardship upon the honest passenger. "Those who are entirely familiar with this business," he adds, "can be aware of the extent of the sentiment that it is not quite as wrong to get the advantage of a railroad company as of an individual." Nor should it be overlooked that in this same report he gave some attention to the subject of depreciation. "A very liberal allowance," he said, "beyond the ordinary current expenses must be made to provide for the depreciation" of railroad equipment. A far-sighted, level-headed official indeed was John Wilkinson.

It is of further interest to note the salaries paid by New York roads in the forties. Frank W. Stevens, of the New York Central, has made a list of the wage-scale of the Schenectady and Troy road, which is as follows: "Superintendent, $800 per annum; conductor, $33⅓ per month; locomotive engineer, $50; fireman, $30; common laboring man, $18; baggage master, $25; brakeman, $20; track foreman, $40; mechanics and repair men, $30; attendant at halfway station, $12.50; ticket agent, Troy, $37.50; depot laborers and switch tenders, $20; agent and collector at Schenectady, $50."

Prior to 1850, information as to exact freight rates is unavailable. A handbill tariff sheet issued by the Albany and Schenectady road divides freight into two classes—a far cry indeed from the complexities of modern classification. A statement from one of these early lines, however, contains this pertinent truth: "Practical railroad men have found that the true rate of fare is to be arrived at by experience and observation, by which the greatest remunerating profit will arise. An increase above that price diminishes the income, and a descent below it by so much percentage as the price descends involves an increase of cars and engines and a diminution of profits." These pioneer railroad men were not "asleep at the switch" when it came to an understanding as to how their business should be run.

With the opening of the Attica and Buffalo Railroad, in 1842, a through train service from Albany to Buffalo was almost made possible. The one break was at Rochester, as the tracks of the then independent lines did not join. In fact, it actually required a law from the State legislature to bring about this physical union. When through service was finally established, it provided for an average speed of thirteen miles per hour.

A further progressive and wise safeguard was provided by the following resolution which was adopted with others at a joint meeting of representatives of the different lines, held in January, 1843. It reads: "Resolved, that the several companies upon this Rail Road line will not employ persons in the business of transportation who *ever* drink intoxicating liquors."

By the year 1853 there were in all eight roads concerned in the operation of a through schedule of trains between Albany and Troy, on the east, and Buffalo and Niagara Falls, on the west. Many of the chief stockholders and officials had been business men of New York City, and in the management of their connecting lines they had naturally been thrown into close contact. A merger was the logical result—one of the first and most important among American roads. Out of this merger was born a new corporation, on May 17, 1853, which took the name destined to be known later the world around as the New York Central Railroad.

VII

EARLY ROADS OF NEW ENGLAND

The Boston and Albany Railroad

If we count as a railroad that first line laid by Gridley Bryant in Massachusetts, for the purpose of hauling granite blocks to the Bunker Hill Monument, by horse-power, in 1826, the history of the railroad logically begins in New England. The succeeding decade, in fact, witnessed the inception of several lines that were the acorns from which the great oaks of the later New England systems grew.

As early as 1830 interest in this new method of transportation had become widespread. Bryant's little tramway had been visited by thousands, and promoters all along the Atlantic Coast as far south as South Carolina, and even into Mississippi, were petitioning their State legislatures for charters and rights of way.

Up at Boston the Massachusetts body was visited by an eager group of citizens, who wished to build an experimental line between that city and Worcester, some forty miles to the west. This was in 1831; but as early as January, 1829, a report was published by the "Board of Directors of Internal Improvements of the State of Massachusetts" on the "Practicability and Expediency of a Rail-Road from Boston to the Hudson River, and from Boston to Providence." This, they argued, would tap the western reserves of the State, and also establish connections with other lines which, rumor had it, were projected in New York. In the light of the successful operation of the Granite Railway, horse-power was advocated. But this was not to be a mere freight carrier, as was Bryant's road; passengers were to be carried, as well.

The legislature readily granted a charter to the petitioners, as soon as they had organized a company, which was known as the Boston and Worcester Railroad Company. The date of the charter was June 23, 1831. Formal organization was perfected a month later, and within a year construction of the roadbed was actively begun. This did not differ essentially from other roads, already described, but as all hands were green at the work it proceeded slowly. The suburban town of Newton was reached, seven miles away, within two years. On April 16, 1834, this little line was formally opened for the carrying of passengers. The first idea of horses was being abandoned, and one or two dinky little steam-engines were on hand, to haul the dinkier little coaches. But it was a great day, nevertheless. The only steam road in the State of Massachusetts, then boasting a population of 700,000 souls, was in operation.

The official notice stated that trains would leave the depot in Boston at 10 A. M. and 3.30 P. M. and returning would leave Newton at 11.15 A. M. and 4.45 P. M.

By the latter part of the year Westboro was reached; and in 1835 they had a great Fourth of July celebration at Worcester. The puffing locomotive had actually reached there! The Worcester *Palladium* in describing the historic event said that "four engines with trains of cars each, carrying in the whole 1,500 passengers, ran over the road four times." Not bad for a pioneer road whose first promoters favorably considered only horse-power.

Meanwhile plans had gone actively forward for a line to proceed from Worcester to the western boundary of the State. This line, known as the Western Railroad, was incorporated March 15, 1833, but an organization was not effected until three years later. In the meantime, the State of New York had chartered the Albany and West Stockbridge Railroad, for the purpose of continuing the Western from the State line into Albany. These dates coming one on top of another show the enthusiasm of the pioneer promoters to link up important centers as soon as possible with the fascinating new system of transportation. We must remember that all this was within ten years after the Granite Railway began hauling its stone by horse-power.

By the year 1838, the Western Railroad commenced construction, and about a year later Springfield in the center of the State was reached. Steadily the grading and track-laying progressed; contractors were learning how by this time; and on December 21, 1841, the state line had been crossed and the first passenger train puffed its way triumphantly into Albany. Ten days later a regular freight service between Albany and Boston had been instituted.

The construction, however, through the western part of Massachusetts, had not been an easy matter. The Berkshire Hills had presented such peculiar difficulties that for a long time the project had met with great opposition, and when finally consummated was hailed as a great engineering feat. Captain Marryat, the English novelist, was touring through the Berkshires during the agitation, and spoke of the "insane persons" who were proposing to build the road "through this mountainous country."

The various lines leading from Boston to Albany were finally merged in 1867, when the Boston and Albany Railroad was incorporated. It continued as an independent organization until the close of the century, when it was leased to the New York Central system.

A Progenitor of the New York, New Haven and Hartford Railroad

One of the early New England roads to achieve fame was the Boston and Providence, which received its charter on June 22, 1831, from Massachusetts; and in 1834, from Rhode Island. Its official title was the Providence-Boston Railroad and Transportation Company. In other words, they proposed not only to build a railroad, but also to haul things over it.

Soon after it received its Massachusetts charter it began construction, with the result that by June, 1834, it had penetrated Readville, and was completed to a point near Providence a year later. That this early line, like others, was only in a chrysalis stage, is evidenced by the following extract from the Journal of a luckless passenger:

> "July 22, 1835. This morning at nine o'clock I took passage on a railroad car (from Boston) for Providence. Five or six other cars were attached to the locomotive, and uglier boxes I do not wish to travel in. They were made to stow away some thirty human beings, who sit cheek by jowl as best they can. Two poor fellows who were not much in the habit of making their toilet, squeezed me into a corner, while the hot sun drew from their garments a villainous compound of smells made up of salt fish, tar and molasses. By and by just twelve—only twelve, bouncing factory girls were introduced, who were going on a party of pleasure to Newport. 'Make room for the ladies!" bawled out the superintendent. 'Come gentlemen, jump up on top; plenty of room there!' 'I'm afraid of the bridge knocking my brains out,' said a passenger. Some made one excuse, and some another. For my part, I flatly told him that since I had belonged to the corps of Silver Grays I had lost my gallantry and did not intend to move. The whole twelve were, however, introduced, and soon made themselves at home, sucking lemons, and eating green apples. . . . The rich and the poor, the educated and the ignorant, all herded together in this modern improvement in traveling . . . and all this for the sake of doing very un-

comfortably in two days what could be done delightfully in eight or ten."

As at present constituted, the New York, New Haven and Hartford Railroad Company, commonly called "the New Haven," has a total trackage of over 2,100 miles, reaching the leading centers of Connecticut, Rhode Island, and Massachusetts, and making through connections with every part of New England. It also controls the New England Steamship Company and the Hartford and New York Transportation Company, which is also a steamship line, a water route of over 1,000 miles and long a favorite way of journeying between New York and Boston, and intermediate points. Its entrance into New York is over leased tracks of the New York Central, but the completion of the famous Hell Gate Bridge, a few years ago, gives it direct rail connection with the metropolis and also makes it possible for passengers from New England to points south to go through on solid trains. New York has actually been made a "way station"!

Early Maine Roads

In Maine we find that, as early as 1832, two railroad charters were granted: the Calais Railroad Company, and the Old Town Railroad Company. The former was a road but two or three miles long running between Calais and Milltown, where large lumber mills were located on the St. Croix River.

It was operated by horse-power for twenty years, when by virtue of an extension to Baring by a new corporation known as the Calais and Baring Railway Company, the use of steam was introduced. This line which was at best only about ten miles long was in the extreme eastern tip of the State, and later a tap-line from the Canadian Pacific extended to Calais.

The Old Town Railway charter provided for construction between Bangor and Old Town, but when in 1835 the franchise was sold to the Bangor and Piscataquis Canal and Railroad Company, the only work done had been some grading and the erection of certain bridge piers. After various vicissitudes and changes of management, the road was finally discontinued in 1870. An historian of the early Maine roads informs the writer that it has been impossible to obtain any records of this company; its history is shrouded in mystery and conjecture.

Another interesting early Maine road, although of somewhat later date, was a "strap-rail" line between Whitneyville and Machiasport, completed in 1842 by a lumber company in order to get its product to tide-water. Steam was used for motive power, two engines being put into service, one in 1842, and the other four years later. A veteran railroader once gave his reminiscences of this lumber road, which if they had come to the attention of John Wilkinson, of the Utica and Syracuse road, mentioned in earlier pages, would have been sufficient to put that worthy gentleman in his grave. Mr. Wilkinson fought during his entire railroad career against the pass evil.

It seems that this lumber road, from the beginning until it ceased operation in 1890 (due to the disappearance of its forest stock) was in the habit of allowing anyone who so desired to ride over its line free of charge. It was only a freight line and not equipped as a carrier of passengers, but if any person wished to take it as it was, he or she was entirely welcome. The obliging engineer would slow down on signal for some agile passenger to swing aboard or jump off; and if it were a lady or older person, he would bring the train to a standstill. What kind of equipment was used is not stated, but the claim is made that on different occasions special trains were made up for hauling passengers to Machiasport to attend lectures and the like, and not a cent was ever charged for such service. Nothing else of the kind has ever been known in the whole history of railroading in the United States.

The Boston and Maine Railroad

The present Boston and Maine system, with its extent of over 2,300 miles, and its ramifications through the greater part of New England, is stated by its management to comprise no less than 165 separate chartered corporations, two-thirds of which actually constructed lines. It is further stated that 54 additional companies were chartered to build railways on some parts of the system now controlled by the Boston and Maine, but failed to do so. While a few of the charters were but formal changes of name, the grand total is further convincing evidence of the intense activity of early New England promoters.

The Boston and Maine corporation as such had its origin in the merger of the Andover and Haverhill with the Boston and Portland Railroad. However, another pioneer road of New England, the Boston and Lowell, is really the one to consider as its genesis. This road harks back to 1829, when a coterie of textile manufacturers of Lowell petitioned the State for a charter to enable them to build a road between Lowell and Boston, for the better handling of their product. At that time the Middlesex Canal and the stage-coach lines furnished the means of transportation for freight and passengers between the two cities, a distance of twenty-six miles. The cotton industry had long since found this inadequate, as the canal route consumed eighteen hours for the journey. Nowadays the same run is made by fast train in thirty-nine minutes!

Through the instrumentality of Daniel Webster, the desired charter was secured June 5, 1830, and active construction was begun immediately. The usual problems of the times confronted the promoters, such as grade-crossings, the kind of track, horse-power, either to draw the cars or operate a tread-mill, sail-wagons, locomotives, and the like. At first it was argued that by following the turnpike, small parties could hire the cars and use the road at will. By October of the following year construction had progressed to such an extent that the directors were forced to make a decision. Was the center of the road to be finished as a horse-path, or "do we determine to use Loco-Motive-Engines?" they asked themselves. The decision was in favor of the Loco-Motive-Engines, being influenced by glowing tales from England. The English influence did not end here. Many of their ideas were adopted, such as the avoidance of grade-level crossings at highways, the result of this wise policy being that there were only three between Lowell and Cambridge.

Almost four years were required to build the road, the blasting being done by common powder, set by hand-drills; while for the preliminary grading ox-teams and hand-labor were the order of the day. Finally on June 24, 1835, the formal opening of the road took place, with the usual rejoicings, speech-making, and banqueting which marked similar occurrences in the young Republic. We of to-day are too blasé to appreciate these thrills that come once in a lifetime.

The eighteen-hour canal boat had its nose put permanently out of joint by the first trip over the new line, which was made in an hour and seventeen minutes. The engine was a four-wheeler, the boiler being enclosed by wooden lagging. The equipment was similar to that of other roads of the day, the engineer and fireman being without the shelter of a cab, and the cars which followed on behind being of stage-coach pattern, each seating six persons. The conductor bore the high-sounding title of Captain, yet he also rode on the outside with no shelter.

One of the first problems from a passenger standpoint was that of local stops. At first the only stop was at Woodburn, now called Walnut Hill, chiefly for the purpose of taking on wood and water; but six months later an official reported that "we are requested to stop at six places, and I think it will require five minutes for each stop. If we add twenty minutes to the time that it now takes our regular train to go between Boston and Lowell, my opinion is that it would injure the reputation of our road for speed. . . . But I would try the experiment." They finally solved the problem by placing an extra engine and coaches on the road for local passenger traffic, so as not to interfere with the speed of the "limited" train—doubtless one of the first "limited" services inaugurated in America.

The first year of operation, the canal receipts were reduced one-third; and five years later when the Nashua and Lowell road opened up, another third was sliced off. The canal was doomed.

This road, like others, was later absorbed by the Boston and Maine system. When Charles Dickens visited America, in 1842, he carried home with him vivid recollections of this road, which he related with gusto in his "American Notes." He says:

> "There are no first and second class carriages, as with us, but there is a gentleman's car and a ladies' car; the main distinction between which is

that in the first, everybody smokes; and in the second, nobody does. . . . In the ladies' car there are a great many gentlemen who have ladies with them. There are also a great many ladies who have nobody with them; for any lady may travel alone, from one end of the United States to the other, and be certain of the most courteous and considerate treatment everywhere. . . . If a lady takes a fancy to any male passenger's seat, the gentleman who accompanies her gives him notice of the fact, and he immediately vacates it with great politeness. . . .

"The train calls at stations in the woods, where the wild impossibility of anybody having the smallest reason to get out is only to be equalled by the apparent desperate hopelessness of there being anybody to get in. It rushes across the turnpike road, where there is no gate, no policeman, no signal—nothing but a rough wooden arch, on which is painted, '*When the Bell Rings, Look Out for the Locomotive.*'

"On it whirls headlong, dives through the woods again, emerges in the light, clatters over frail arches, rumbles upon the heavy ground, shoots beneath a wooden bridge which intercepts the light for a second like a wink, suddenly awakens all the slumbering echoes in the main street of a large town, and dashes on haphazard, pellmell, neck or nothing, down the middle of the road.

"On, on, on—tears the mad dragon of an engine with its train of cars; scattering in all directions a shower of burning sparks from its wood fire; screeching, hissing, yelling, panting, until at last the thirsty monster stops beneath a covered way to drink, the people cluster round, and you have time to breathe again."

We said at the beginning that the Boston and Maine had its real origin in the consolidation of the Andover and Haverhill with the Boston and Portland road. The former was chartered, March 15, 1833, for the purpose of constructing a line from the station of Wilmington, on the Boston and Lowell road, to Andover, seven miles away. The road was opened for traffic three years later, but in the meantime its progressive board of directors decided to extend the terminus to Haverhill, and later to the New Hampshire state line. The Andover and Haverhill Corporation became the new title of the project and, still later joining with the New Hampshire corporation called the Boston and Portland, the Boston and Maine Railroad was formed.

Another old link in the Boston and Maine system was the Eastern Railroad, incorporated in 1836, which, when it opened two years later, extended from East Boston to Salem. A copy of the "Instructions for Conductors and Enginemen" issued at that time discloses that horseback riding was part of the routine work expected, and conductors were instructed to see that "when anything shall happen to a train to render assistance necessary, a brakeman be dispatched on horseback," while the "Master of Depot" was directed that "if at any time a train should not arrive at either depot, in one hour from the time of its starting from the other," he should immediately "start on horseback to learn the cause of the delay."

Further items of interest gleaned from archives of the Boston and Maine road included the fact that the first railroad tunnel of any size in America was the Hoosac Tunnel, in the construction of which air-drills and nitroglycerin were employed for the first time. Also, the first successful interlocking switch was placed in use in Lowell—but this was as late as 1881. The Mount Washington Railway for tourists was the first in the world to make use of the rack-rail, and the vertical boiler. The vertical coupler was devised by an employee, and was the forerunner of the United States Coupler. In other devices large and small for the safety or comfort of its passengers this old road has always shown a progressive spirit.

VIII

OTHER EARLY EASTERN ROADS

The Delaware and Hudson Railroad

In the opening pages of our first chapter on "Early American Locomotives" we spoke of the famous "Stourbridge Lion" as the first successful engine operated in America. This ran upon the line of the Delaware and Hudson Canal Company, and the history of the system which succeeded from this small beginning is thus one of the longest in the annals of our railroading. It had its origin in the mining of a new and untried fuel—anthracite coal. As a recent statement of the "D. and H." puts it: "The history of the Delaware and Hudson Company is the story of certain anthracite mines and the avenues of transportation by which the product of these mines has been brought to market." But back of this bald statement lies one of the romances of early railroading—some of which we have already touched upon in preceding pages.

In the early years of the nineteenth century people began to talk about "stone coal" and to speculate as to whether it would or would not burn. The first venders of the product had an uphill job in converting the public to the idea that it was good for anything. Prior to the War of 1812 we actually imported soft, or bituminous coal from England. Wood and charcoal produced in the young Republic also did their bit in feeding the furnaces of our struggling manufactories. When the aforesaid war cut off the English coal, two enterprising merchants by the name of Wurtz became imbued with the idea of seeking out and marketing a substitute. Their travels took them to the Lackawanna Valley, whence rumors had been emanating as to the "stone coal." Although known to exist for a hundred and fifty years, it was locally regarded as of little value, and no attempt had been made to market it.

The Wurtz brothers did some quiet investigating and experimenting on their own account, not paying much attention to the corner-grocery wiseacres, and as a result began to buy up anthracite land. Mines were opened in a small way, and by the latter part of 1822 a thousand tons of coal lay out upon the surface of the ground waiting means to transport it to the nearest cities.

At practically the same time a group of New York promoters became interested in the same project. They also had heard of the rich deposits of "stone coal," and on April 23, 1823, obtained a charter from the State of New York, enabling them to transport the product from the Carbondale district in Pennsylvania to the city of New York and other points in the State. The Delaware and Hudson Canal Company, as it was styled,—for in those days the canal was still dominant in transportation—sent engineers and surveyors down into the coal country, and they were not long in discovering the Wurtz brothers and their thousand tons of mined coal. As the interests of the two groups were identical, they decided to combine forces.

Naturally their first efforts were directed toward canals. Surveys were made from the property as far east as the Hudson River, under the direction of Benjamin Wright, the engineer of the Erie Canal, who made his report public in 1825. From our standpoint the most noteworthy recommendation that he made was to the effect that the final link connecting the waterways with the mines should be—a railway! He was driven to this recommendation because of the impracticability of constructing a canal through the mountainous country which lay between the Wurtz mines and the headwaters of the Lackawaxen River. "There remains then only a good road, or a railway," said Wright. "The latter, I think, will be preferred."

Wright was made chief engineer of the canal construction, which soon began, and upon his resignation, in 1827, his assistant, John B. Jervis, for many years an engineer of high distinction, was made chief. Jervis' first task was to survey and locate a railroad route from the canal terminus to Carbondale. His preliminary report was quite voluminous and showed an amazing grasp of the problems of railroad construction. He advocated a "double-rail" instead of a "single-rail"; preferred "rolled-iron" to "cast iron" rails; discussed the relative merits of iron and wooden wheels; and finally gave his opinion of the various engineering problems involved.

Five inclined planes from Honesdale to the mines were recommended, with as many stationary engines; while for the comparatively level stretches locomotives were advocated in preference to horse-power.

Jervis' report was finally adopted, and Horatio Allen, another engineer who had been engaged upon the canal construction, and who, like his chief, lived to become a famous railroad man, was sent to England to purchase the iron for the track and let the contract for four locomotives. His instructions for the latter were unique. The speed was to be about four miles per hour (they evidently didn't expect much of the new machines!). The gauge was to be four feet, three inches. The number of wheels on each engine was optional with Allen, either four or six wheels. No cars were to be contracted for, but their construction and availability for use in hauling coal was to be carefully studied.

At this time Allen was only twenty-five years of age, and to put so important a mission on such young shoulders was noteworthy. He soon, however, won a friendly footing with Stephenson, the famous English inventor, and learned many things of advantage to himself and his road. To Stephenson was given the contract for one of his engines, the other three being contracted for through a firm in Stourbridge.

While the names of Stephenson's machine and two others must always remain in doubt, the fourth, called the "Stourbridge Lion," has achieved eternal fame in the railroad world by virtue of the fact that it was the first locomotive to turn a wheel in America. Delivered, it cost the Delaware and Hudson Company about $3,000. By river and canal, after its overseas trip, it reached Honesdale the latter part of July, 1829, and on August 8 the initial trip of a steam locomotive on American soil was made, with Allen himself at the throttle.

While the trip from one standpoint was a success, the track itself was not found sufficiently stable for the operation of the locomotive. A later trial trip only confirmed this view, so the "Lion" was stored alongside the track, where it stood for twenty years.

At the formal opening of the New York and Erie Railroad, in 1851, Horatio Allen, who acted as its president for a brief period, made an address on the "Coming of the Locomotive," in which he said:

> "When was it? Where was it? And who awakened its energies and directed its movements? It was in the year 1829, the month August, on the banks of the Lackawaxen, at the commencement of the railroad connecting the canal of the Delaware and Hudson Canal Company with their coal mines, and he who addresses you was the only person on that locomotive. The circumstances which led to my being alone on that engine were these:
>
> "The road had been built in the summer; the structure was of hemlock timber, and rails of large dimensions notched on caps placed far apart. The timber had cracked and warped from exposure to

> the sun. After about 300 feet of straight line, the road crossed the Lackawaxen Creek on trestle work about 30 feet high, and with a curve of 350 to 400 feet radius. The impression was very general that this iron monster would break down the road, or that it would leave the track at the curve and plunge into the creek. My reply to such apprehensions was that it was too late to consider the probability of such occurrences; that there was no other course but to have the trial made of the strange animal which had been brought there at great expense; but that it was not necessary that more than one should be involved in its fate; that I would like the first ride alone, and the time would come when I should look back to the incident with great interest.
>
> "As I placed my hand on the throttle valve handle I was undecided whether I should move slowly or with a fair degree of speed, but holding that the road would prove safe, and preferring, if we did go down, to go handsomely, and without any evidence of timidity, I started with considerable velocity, passed the curves over the creek safely, and was soon out of hearing of the cheers of the vast assemblage present. At the end of two or three miles I reversed the valve, and returned without accident to the place of starting, having made the first locomotive trip on the western hemisphere."

The roadbed was strengthened, at least for lighter hauling, and on October 9 of that year, 1829, the first shipment of anthracite was made. During the first years the road was a freight carrier exclusively, the only exception apparently being the coming of a party of influential sightseers from New York, by canal to Honesdale and thence over the rails to Carbondale. The party of twenty, including some ladies, were placed on board two primitive coal cars, but the ladies were reported as being delighted with "a mode of travel so novel and so interesting."

A report for January, 1831, showed the company in possession of 275 "wagons," as they were called.

About this time another railroad project, which ultimately became part of the D. and H. system, was under way in New York. On February 16, 1831, the legislature chartered the Saratoga and Schenectady Railroad Company, to build a line between these two points, which was to be operated "by the power and force of steam, of animals, or any mechanical or other power." They were taking no chances. In this, as in the former project, Jervis was chief engineer. By the middle of 1832 the road was open, with the faithful horse furnishing the motive power.

A year later the countryfolk gathered for miles around to see the first locomotive in operation upon it. This had a good American name; it was called the "Davy Crockett," and was an innovation in steam locomotion, being constructed by Stephenson in England from plans prepared by Jervis. It was Stephenson's first "bogie" engine, as it was called, at first in derision, the principle being "to connect the frame of the forward wheels with the cross-piece by a king pin at the center only, thus enabling these wheels to turn freely on curves," As our pioneer roads were blessed with sharp curves, this simple idea was really a godsend to railroading.

The "Davy Crockett" delivered the goods; this is not slang, as it is on record that the engine hauled fifteen tons of freight at a rate of seventeen miles an hour. A contemporary journal estimated that it did the work of fifty horses, and on only five bushels of coke, thus saving $35 a day. The first trip was made, July 2, 1833, from Schenectady to Saratoga Springs. The route immediately became popular, and freight had to wait its turn until the clamoring multitude was served. In one week "Davy" hauled 3,500 passengers, at times the train consisting of as many as eight "carriages" and three baggage "wagons." Indeed, the road was for some time looked upon as a pleasure medium, and hauled but little freight.

This short line later passed into the control of the Rensselaer and Saratoga company, chartered in 1832 to run from Waterford to Ballston Spa, and that in turn finally became a part of the D. and H. system.

The Delaware, Lackawanna and Western Railroad

Another prominent Eastern railroad, which had its inception in the desire to tap the anthracite coal deposits of Pennsylvania, is the Delaware, Lackawanna and Western Railroad, familiarly known as the "Lackawanna." Although the present corporation claims for parent the Ligget's Gap Railroad in the hard coal section, yet by virtue of a lease, in 1855, of the Cayuga and Susquehanna Railroad, we must go back still farther.

On January 28, 1828, the New York legislature chartered a line to be known as the Ithaca and Owego Railroad, to connect these two towns, and with a capitalization of $150,000. The enabling act set forth the duties and privileges of the road in some detail. It could hold and own land; could determine the width of its track; could collect toll; could employ either horse or mechanical power; could haul either freight or passengers; could cross highways or streams; and do various other things. A peculiar provision allowed to anyone with a proper vehicle the use of the tracks, on payment of a prescribed toll.

A later section recited that "if any person shall willfully and maliciously injure the said railroad, or any building, machine or other work of the said corporation appertaining thereto, the person so offending shall forfeit and pay to the said corporation three times the amount of damages sustained by means of such offence or injury, to be recovered in the name of said corporation with costs of suit, in any court having cognizance thereof." Rather a stiff penalty that!

In 1843, the Ithaca and Owego road was absorbed by the Cayuga and Susquehanna Company, by act of the legislature.

Now to trace up a further connecting link—on April 7, 1832, the Pennsylvania legislature authorized the incorporation of the Ligget's Gap Railroad from Providence (now Scranton) northerly to the Susquehanna River at Great Bend. But for almost twenty years nothing of a definite nature was done. Then, in 1847, the attention of some of the large land-owners in the Scranton district was attracted by the New York and Erie construction on the north side of the state line. They saw the possibilities of using the Ligget's Gap project in connection with the road, in getting the Lackawanna Valley coal and iron deposits to market. The Scranton promoters secured control of the slumbering Ligget's Gap road, and obtained further financial aid in New York.

In 1850 construction commenced, and in less than a year and a half the road was completed between Scranton and Great Bend, where it connected with the New York and Erie. Trackage rights were obtained over the latter to Owego, as well as control of the Cayuga and Susquehanna, above referred to. The roadbed was improved by the new company and, on October 16, 1851, the first coal train moved out of Scranton for Ithaca, on Lake Cayuga, where connection was made with the Erie Canal, and thus with tidewater.

In this same year the name was changed from the Ligget's Gap Railroad to Lackawanna and Western; and two years later after further consolidations, it became the present Delaware, Lackawanna and Western. From that time to the present a steady expansion has taken place. Due to its foundation of rich coal deposits, the road did not have the financial struggles of its neighbor, the Erie. So exclusively was it a coal road in its early days that, prior to 1900, it was not even equipped to handle passengers. A vigorous advertising campaign of recent years, with alluring pictures of Phoebe Snow, the spotless lady of the "Road of Anthracite," has brought the road its share of through passenger traffic.

One particularly noteworthy fact concerning the Lackawanna road lies in "the powers with which it was endowed to acquire and hold coal lands, and mine and sell coal. Early in its corporate history there was a direct grant of this power by a special act of legislature . . . and this grant was augmented from time to time both by grants direct to the railroad company, and by mergers between 1864 and 1870 of various coal companies. . . . Pursuant to general laws under which these mergers were effected and the agreements of mergers themselves, not only the large tracts of coal lands and other property of the merged coal companies, but all their rights, powers, franchises, and privileges passed to the railroad company."[1]

Thus the "stone coal" deposits lying neglected until a hundred years ago brought prosperity to at least one common carrier, and an immense industrial development to the northeastern section of Pennsylvania centering around Scranton. Anthracite coal has become such a prime necessity that a strike in this district is viewed as a national calamity.

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[1] Extract from a letter from an official of the road to the present writer.

The Lehigh Valley Railroad

Another prominent railroad of the East, which had its origin in the problem of finding an outlet for anthracite coal, was the Lehigh Valley Railroad. Its first official sanction was on April 21, 1846, when the Pennsylvania legislature granted a charter to the Delaware, Lehigh, Schuylkill and Susquehanna Railroad Company. It would require a string of cars just to carry that company's name! The proposed route was from Mauch Chunk to Easton, at the junction of the Lehigh and Delaware rivers. This charter was obtained by Edward R. Biddle, a Philadelphia banker, who soon saw his bright hopes go glimmering, as the requisite funds for the road's construction could not be raised.

The project was allowed to slumber until 1851, when Asa Packer, a boat operator on the Lehigh Canal and River Company, purchased the majority of the stock from the original subscribers, and by enlisting the financial assistance of his friends, of which he seems to have had a great many, he finally got the venture going. Perhaps he also thought that the original cumbersome name was a hoodoo, for it was soon changed to the Lehigh Valley Railroad, under which the extensive system which has resulted still operates.

The first line from Mauch Chunk to Easton was energetically started and completed in a few years, despite engineering difficulties due to the mountainous country. It gradually extended both eastward and westward, tapping one of the most beautiful scenic sections of the East; but doubtless the perspiring surveyors and contractors did not appreciate the scenery quite so much as the later riders on the road have done. The route now lies through the anthracite regions of Pennsylvania and the historic Wyoming Valley up through the beautiful Finger Lake section of western New York; ending at the Suspension Bridge from which one gets a glimpse of the thundering waters of Niagara Falls.

A statement by the present management says that the Lehigh Railroad was one of the first to see the advantages of the three-cylinder type of locomotive, and because of this the American Locomotive Company has called this particular type the "Lehigh"; likewise it was one of the first to make use of rail motor cars as an auxiliary to steam. But this didn't happen until the year of our Lord, 1923.

The Central Railroad of New Jersey

The record of important Eastern roads is not complete without mention of the Central Railroad of New Jersey system. That great oaks spring from little acorns is again illustrated by the fact that a little line extending from Elizabeth to tidewater at Elizabethport, a distance of two and a half miles, was the parent stock of the Central. Now be it known, the system includes forty-eight separate corporations, and controls twelve others. It is a main artery of the thriving State from which it takes its name.

The Elizabethtown and Somerville Railroad was chartered in 1831; its capital stock was immediately subscribed for; and by 1839 the road was in actual operation from Elizabethport as far south as Plainfield. Three years later it had reached Somerville.

Five years later still, in 1847, the Somerville and Easton Railroad was projected and began its track-laying to the west. In April, 1849, a merger was effected under the title of The Central Railroad of New Jersey. At the time of the merger the combined equipment consisted of only six passenger coaches. There is no record of the number of locomotives or freight cars.

While the track-laying proceeded slowly but steadily westward until, by 1852, it had reached Phillipsburg, across the river from Easton, the promoters were casting their eyes anxiously to the east. Their terminal at the little haven of Elizabethport was inadequate, they realized. They wanted to reach Jersey City and thus New York and the East; but between them and that goal lay the salt meadows and Newark Bay—many thought insurmountable,—and great was the popular opposition when the company announced its plans for bridging the Bay. A further handicap was the outbreak of the Civil War, diverting attention, money and men to the South.

Despite all these handicaps, which were far more formidable than we can realize, as we calmly read about them to-day, the company went ahead and, in 1864, had completed its bridge, which historians of the day hailed as a great engineering feat. At the formal opening of the bridge, on July 29, some six hundred guests were present, and the road's president, John Taylor Johnston, was in charge of ceremonies. The present incumbent, William G. Besler, recently told of this historic occasion, in the "Annals" of the New Jersey Central.

It seems that the first trip of the extension through the Bayonne peninsula began at Flemington. As the train progressed it gathered its passengers, until the several hundred invited guests were all on board the laden cars. Evidently no fears were felt for the capacity of the new bridge. Arriving at Jersey City, they boarded the ferryboat, *Central*, and sat down to enjoy the good things provided on the long dining-tables. President Johnston wrote, the next day, to his wife an account of the affair, from which the following interesting excerpts are taken:

> "I had arranged to have a blessing asked at each table, but before any such thing was possible all hands and mouths were hard at work, and it is very doubtful if twenty on board knew whether we went down the bay, or up the bay, or both! They found abundance of time, however, to praise the boat. She is universally admitted to be a beauty, even by those interested in running her down. The fifty baskets of champagne and forty baskets of claret began now to disappear with

marvelous celerity, and though as a whole, the crowd behaved well, yet, as soon as we saw some beginning to get noisy, we stopped the wine, and kept the fun within bounds.

"Before we landed, I got on one of the tables and made a short speech, thanking them for their attendance and making a suitable allusion to Superintendent Stearns. They then began cheering for one another, and at 4:45 I had the satisfaction of landing them at Pier 2, North River, without accident or drawback of any sort. It was a successful opening and a decent one. So far as I saw, there was not a drunken man, or one half-seas over among the lot, and we had plenty who do that same occasionally."

IX

THE PENNSYLVANIA RAILROAD

An unpublished official history of the Pennsylvania Railroad, which it has been the writer's privilege to examine, states that the inception of the road "is usually dated from a meeting called for December 9, 1845, by 513 citizens of Philadelphia, to discuss or rather to demand 'the immediate construction of a railroad . . . from Harrisburg to Pittsburgh.'" To strike further back on its tap-root, however, we must go almost to the beginning of the century.

John Stevens, who has been called "the father of the Pennsylvania Railroad," was a man of means and vision who, as early as 1787, became interested in the theory of steam operation, as he witnessed the primitive attempts of John Fitch to run a steamboat on the Delaware River. In 1812, he prepared a pamphlet titled "Documents tending to prove the Superior Advantages of Railways and Steam Carriages over Canal Navigation." He boldly advocated government ownership of such utilities, and his paper was directed to the New York legislature as an argument against the Erie Canal, which was then upon the knees of the gods. But Stevens was too far ahead of his time; the canal was built, and railroads slumbered in America for fifteen or twenty years more.

Stevens, undaunted, turned his attention to New Jersey, his own State. He lived in a handsome estate on the heights of Hoboken, looking across the lordly Hudson to New York. He next secured a charter to build a railroad from New Brunswick to Trenton, which was to be operated by steam locomotives. This charter, obtained February 6, 1815, is said to be the first of its kind. Still, however, Stevens was too far in advance of his time, and had to give up his plan as, in his own words, "the public mind was not sufficiently enlightened to induce moneyed men to embark their funds in a project then considered wild and impracticable."

But this did not discourage the intrepid promoter. Three years later he turned his attention to the neighboring State to the west, and tried to enlist interest in the Pennsylvania legislature "on the Expediency of a Railroad from Philadelphia to Pittsburgh." Still later, in an open letter to the mayor of Philadelphia, he advocated a steam road from that city to Columbia, a distance of about eighty miles; and, on March 21, 1823, he actually obtained a charter from the legislature for such a line, to be known as the Pennsylvania Railroad.

Further to illustrate the far-seeing wisdom of this man—one of the giants in American railway pioneering—he strongly urged a system which should extend from Philadelphia to Pittsburg, "and thence into the heart of the extensive and fertile State of Ohio, and also to the great western lakes"; and not only that, but an extension "from Philadelphia across New Jersey to the City of New York." It was as if, like Moses on the mountain peak, he looked across the years into the Promised Land; for he foresaw, one hundred years ago, the Pennsylvania System of to-day.

Stevens, however, shared the common fate of prophets; he was mocked as an impractical dreamer. Although then seventy-three years of age, he went forward with the preliminary surveys of the road to Columbia, being assisted by a few other able men of vision, among them Stephen Girard and Horace Binney. The surveys made, they tried to obtain a popular subscription to the project, but their appeals fell upon deaf ears. Stevens thereupon retired to his estate in Hoboken, and busied himself upon the construction of actual locomotives, hoping by this means to educate the public mind. He built a workable engine having a multi-tubular boiler, and ran it on a circular track within his own grounds. Successful trips were made repeatedly, the little car attached carrying half a dozen passengers at a time. This, be it remembered, was in the year 1825. A good model of his locomotive is on exhibition in the National Museum at Washington. When Stevens died, in 1838, at the advanced age of eighty-nine, he saw the country suffused with the spirit of railway building and operation—an object for which he had striven for half a century.

Meanwhile, in 1826, the Pennsylvania legislature repealed the charter granted to Stevens, but passed

Courtesy, Delaware and Hudson Railroad

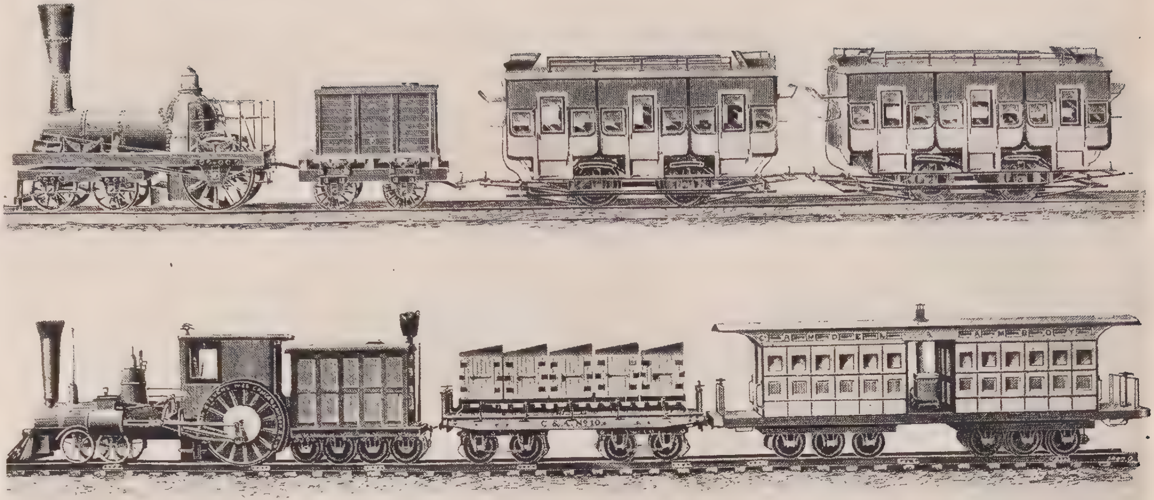
WOULD STEPHENSON RECOGNIZE THIS?

A modern giant of the rails—the John B. Jervis. No. 1401, latest high-pressure steam locomotive used on the Delaware and Hudson Railroad.

Courtesy, Pennsylvania Railroad

COLONEL THOMAS A. SCOTT

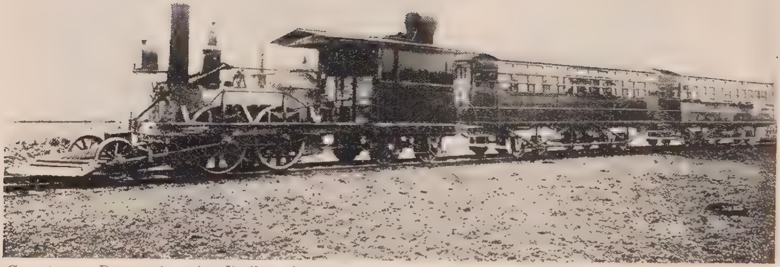
President of the Pennsylvania Railroad from 1874 to 1880, and one of the greatest practical railroad managers this country has ever produced



Courtesy, Pennsylvania Railroad

EARLY AMERICAN TRAINS

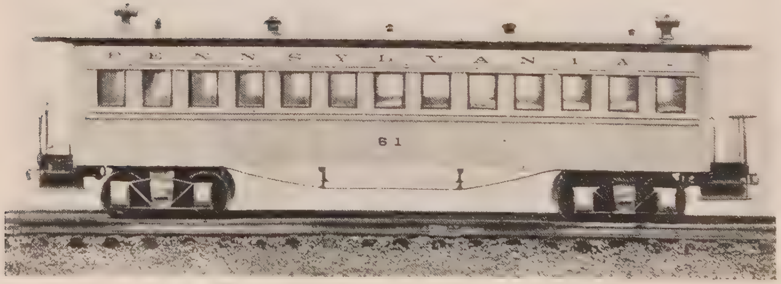
The "John Bull" locomotive and cars (above) and a "de luxe" train on the Camden and Amboy Railroad, in the forties



Courtesy, Pennsylvania Railroad

DE LUXE SERVICE IN THE FORTIES

A train on the Camden and Amboy Railroad drawn by the famous engine, "John Bull"



Courtesy, Pennsylvania Railroad

A CIVIL WAR PASSENGER COACH

The kind that Lincoln and his associates traveled in, on the Pennsylvania Railroad an amendatory act keeping alive the project of a road between Philadelphia and Columbia. Another survey was made, by Major John Wilson of the U. S. Army, who published his report in January, 1828. Public opinion had veered sufficiently, so that now a new law was enacted providing that the "Pennsylvania Railroad" should be built with State funds. Twenty miles was authorized at each terminus for immediate construction, and $2,000,000 was appropriated for same. One of the engineers working under Major Wilson was a young man by the name of John Edgar Thomson, who later became president of the road. By the latter part of 1829 the forty miles were completed, and the money was gone. It was not until March, 1831, that an additional appropriation of $800,000 was made, and the work could be resumed. However, as early as May, 1829, horse-drawn cars were used upon certain parts of the road, for construction purposes.

On April 16, 1834, the road was officially opened for its whole length, amid rejoicing, with the State dignitaries in evidence. Too bad that old John Stevens, if his health had permitted, could not have been the chief guest of honor! The track was built with stone ties and wooden strap-rail stringers, with a horse-path running between. While a locomotive was tried out, that same year, a horse-car usually went along with it to serve in case of breakdown. Relay stations were also provided at frequent intervals, but despite these precautions it is stated that many times the passengers were requested to "turn out" and lend their energies toward starting the stalled train.

As with many other early roads, any individual or corporation wishing to use the roadbed privately could do so, employing their own horse and vehicle, on payment of the authorized toll. We can readily imagine the confusion which resulted, until this unwise law was abrogated.

In the meantime, a progressive body of business men of Lancaster, located on the route, began to advocate an independent line running from their city to Harrisburg. A charter was secured for this, in 1832, and a few years later the Harrisburg, Portsmouth, Mt. Joy and Lancaster Railroad was put in operation.

We now come to the year 1845 and the real beginning of the present Pennsylvania system. A glance at the transportation facilities in the State at this time reveals a remarkable condition of affairs. From Philadelphia to Columbia the distance of 82 miles was connected by rail; thence to Hollidaysburg, 173 miles, by a canal parallelling the Susquehanna River to the mouth of the Juniata, and thence along the Juniata to the base of the Alleghenies. From Hollidaysburg to Johnstown a railroad 26 miles long was in operation, having a series of ten inclined planes with stationary engines and cables; and from Johnstown to Pittsburgh, 105 miles, a canal was again the mode of transportation.

Clearly it was high time that something should be done!

Mr. Rea, a later president of the Pennsylvania, gives us a graphic picture of the antiquated method of hauling freight across the State by a combination of short railroads, canals, and inclined planes, —a condition which actually resulted in the practice of some shippers in western Pennsylvania, of sending their goods down the Ohio and Mississippi rivers by barges and steamboats, and thence from New Orleans to Philadelphia by coastwise steamers—a water journey of many hundreds of miles just to get across their own State!

The canal-boats were of special type. Mr. Rea says:

> "They were built in short sections for convenience in handling and to make their movement overland practicable. On the westbound trip the start was made from various points in Philadelphia, each section of the boat being mounted on wheeled trucks. These were pulled through the streets by mules to the western edge of the city, thence across the old Columbia bridge over the Schuylkill River to the foot of what is now Belmont Plateau in Fairmont Park, where the Philadelphia and Columbia Railroad had its beginning. The boats were pulled up to the plateau by an inclined plane, and then moved on the rail line to Columbia, where they were placed in the canal, and the sections joined together. They were then pulled by mules along the tow-path to Hollidaysburg. At

> Hollidaysburg the sections were again separated, mounted on wheeled trucks, and pulled over the mountain, via the inclined planes and the Portage Railroad, to Johnstown. They then once more entered the water to complete their journey to Pittsburgh by canal."

In winter-time when the canals were frozen over, even this primitive means of shipping through freight was denied. Mr. Rea further says that when the State works were abandoned, a few years later, a debt of $40,000,000 was outstanding.

It is small wonder that indignation meetings began to be held, which culminated in the one mentioned in our opening paragraph, held in Philadelphia, in 1845. The body of legislators were told in no uncertain tones that they must get busy. As a contemporary newspaper put it: "The subject of a continuous railroad from this place to Pittsburgh engages a large share of conversation among members . . . and it need not surprise anyone if it is found that a large part of the business of the session should be found to pertain to road-making."

The proposed central route, however, did not hold the center of the stage undisputed, as the Baltimore and Ohio company, for some years in active existence, was also on the job with a proposition to build an extension of its road from Cumberland to Pittsburgh. This alternative route had its ardent supporters, and some intensive lobbying was done. Hundreds of memorials poured in upon the legislature, urging the central route, as "the very lifeblood of the State" was at stake.

As a matter of record, both charters were granted, in 1846, within a few days of each other; but there was a joker in the Baltimore and Ohio bill, of which the central Pennsylvania adherents were not slow to take advantage. It provided that the Baltimore and Ohio charter should not become effective until July 31, 1847, and that if in the meantime the promoters of the Pennsylvania should secure bona fide subscriptions for three million dollars worth of stock, ten per cent. of which should be actually paid in; and further, if thirty miles of the road should be under construction, the act of granting the right-of-way to the Baltimore and Ohio should be "null and void."

It is hardly necessary to add that this highly-desirable "null and void" condition was accomplished —but not without a struggle. Public meetings were held; the Philadelphia city council was importuned; and finally a house-to-house canvass was made. With victory perching upon their weary banners, the promoters submitted their subscription list to the governor, who placed his official O. K. upon them; and on February 25, 1847, "The Pennsylvania Railroad Company" was an accomplished fact. The document, which shows a total subscription list of over 60,000 shares at $50 each, is now preserved in the Directors' rooms, in the Broad Street Station, Philadelphia.

The preliminary financial difficulties being now overcome, the next step was to grapple with the engineering problems, and they were no light ones. For this undertaking J. Edgar Thomson was wisely requisitioned, to act as chief engineer. He had served in a similar capacity for a southern road, the Georgia, and it will be remembered that he was one of the original engineers of the Philadelphia and Columbia. Thomson was, in fact, one of the great railroad men of his time. Within five years he had been elevated to the presidency of the new Pennsylvania system, and under his wise administration lasting for twenty-two years he witnessed his road expand into a place of commanding importance. Eminent engineers of our own time say that, if confronted with the engineering problems which beset Thomson when he became chief engineer, they could not improve upon his line of route across the state.

One of the early lines which is now a part of the Pennsylvania system was the Camden and Amboy Railroad, which was chartered in 1830. It ran from the Delaware River to the Raritan Bay. Special privileges were granted the road, and in 1834 the entire line, a distance of sixty-one miles, was opened for business. Local freight traffic was encouraged in every way, by the enterprising company, and regular runs were soon established, during certain seasons, for the hauling of vegetables, fruit, and livestock. It is of interest to note that a single consignment of thirty tons of green corn was handled on one trip. An item of further interest is to the effect that, one winter, the children of Bordentown made considerable pocket money by selling heated bricks to chilly passengers.

An old railroader has left his reminiscences of a trip which he made as a passenger over this road. At South Amboy, the eastern terminus, connections were made by steamer with New York. After he had purchased his ticket, having stated where he was from and where he was going, the narrator says that he left the station to take a train, and saw "a string of letters about thirty feet apart marked A, B, C, D, E, and F. If your ticket had a big red C on it, you would go into the car opposite where the big C was hanging. You would go in at the side of the car, as there were no end doors." He continues:

> "The engines were queer-looking from ones I had been accustomed to see. The engine proper had only four wheels. Ahead of it pushed a cow-catcher, which had two wheels under it. The cow-catcher was a wooden arrangement about four feet long, and looked to me like a big stove grate, and was not more than about two inches above the rail. It had three very sharp hooks fastened on it, which was bound to hold a cow or anything that it would run against. On the rear end of the tank, setting up high, there was a coop which looked like those old style sulky tops. There is where the guard would sit. His duty was to watch the rear end of the train in case it broke. At first I did not know what they were for."

This same employee, George Cobaugh by name, states that in the fall of 1837 the first engine which ran between Middletown and Harrisburg was brought up from Columbia on a flat and conveyed by hand-power to the track, several blocks from the river, over scantling which was laid along the way. At that time the road ran only as far north as the east end of the tunnel at Elizabethtown and thence the passengers were conveyed by stage-coach to Middletown, where they took the train for Harrisburg.

It took several days to adjust the new engine before the trial trip was made, and many hours of patient firing and stoking before sufficient steam was generated to start.

> "When everything was ready the engineer crawled on the engine," said Mr. Cobaugh, "and hooked it in the gear, and then pulled the throttle. You should have seen the crowd scatter and try to run over each other to get away. As the throttle was opened the steam began to fly out of the cylinder cocks, which were left open to allow the condensed water to escape. It made quite a racket which no one was accustomed to hear.
>
> "Every evening between five and six o'clock there would be a long stream of stage-coaches and baggage-wagons come in at the east end of town, and go up to the Center Square, and then turn down Union Street to the railroad. It would take considerable time to transfer the baggage and there was lots of it, as the passengers would carry all the luggage the company would allow.

It was always late before the train would get away, and the crowd would stay until the train pulled out, just to see the sparks fly out of the top of the smoke-stack. Being a wood-burner, the engine would leave a regular streak of sparks as long as the train was in sight.

"When there was snow three or four inches deep, there were no trains until the rails were shoveled off. Often have I seen some of the boys sitting on the bumper of the engine holding a snow shovel down on the rail to clean the track. Often the shovel would catch on a snake-head, then over the snow cleaners would go into a snowbank ahead of the engine, providing they could not leave go of the shovel-handle in time. Generally they were on the lookout for a trick of that sort, but sometimes they were caught unaware. As the engine did not run over about three miles an hour, there was not much danger, as they would sit on the end of the bumper outside of the rail, and hold the shovel with the right or left hand, so if they got caught they had nothing to do but climb on again and run the risk of being caught once more.

"I recollect that the road was very crooked. Some of the men told me that the engineers to locate the road were brought from England, and that they got five dollars extra for every curve, and that they made it all curve.

"All freight trains were run on a wild-cat schedule. They would run only when enough cars had accumulated to make up a train of eight or ten cars, which was about as much as an engine was able to get along with.

"And at that time cars were not so very plenty.

The Pennsylvania state road did not own any; the Harrisburg and Lancaster had none; the Cumberland Valley owned none. All cars were owned by individual parties. All the companies had nothing but locomotives and would pull any car for any one that paid a certain amount for each wheel per mile, which was called wheel toll. They would charge more wheel toll for a loaded car than for an empty one."

As in the case of other great railroads, the gradual rise of the Pennsylvania during the eighty-odd years of its existence is a fascinating study to the student of economics and railroading. It does not differ in essentials, however, from the story of other lines. There were gradual improvements in roadbed and equipment, the merging of connecting lines, the consolidation of interests, until at last every important center in the parent state was linked up with its neighbor by shining lines of steel, which also pursued an unbroken pathway as far west as Chicago and St. Louis.

By virtue of the territory penetrated, the present Pennsylvania Railroad system has had thrown upon it, in the words of ex-President Rea, "a greater volume of traffic, measured in tons of freight and passengers carried one mile, than is handled by any other transportation system, not only in the United States, but in the world." It now owns and operates over 11,500 miles of road, and over 27,500 miles of total trackage, traversing thirteen states. The aggregate investment is over two and one-third billions of dollars, and the number of stockholders approximately 250,000, a larger number than any other similar organization, American or foreign. Incidentally it holds the record for the longest unbroken record of dividend payments.

Paul T. Werner, in his comprehensive treatise on "Motive Power Development on the P. R. R. System," states that "the work of building up the Pennsylvania system has been accomplished on a conservative basis, using sound judgment, but never hesitating to make improvements which would enhance the value and efficiency of the property. . . . As a result of this policy, there has been developed a Department of Tests at Altoona, which in point of equipment and valuable research work accomplished, has no equal among the railroads of the United States. Furthermore, the results of locomotive tests made on the Altoona plant have been widely published, and railroads the world over have been able to profit by them."

In brief, this great system has set a high mark and is consistently striving to live up to it—choosing for its slogan, "The Standard Railroad of the World."

X

THE FIRST RAILROAD WEST OF THE ALLEGHENIES

While the Ponchartrain Railroad in Louisiana has been sometimes called the first railroad west of the Alleghenies, its incorporating having antedated the Lexington and Ohio road by one week, the latter seems the logical subject for this chapter, as it lay directly to the west of these mountains which for so long presented an impassable barrier to transportation in the Middle West.

Back in the famed Blue Grass region of old Kentucky, the breeders of prize race-horses were by no means blind to the advantages of steam—and that at a very early day in railroading. In the late twenties and early thirties this section of the country was rapidly forging ahead, thanks to the Ohio River which formed the great artery of commerce. Louisville and Cincinnati were growing rapidly, which was a source of pride to their citizens, but of discontent and envy to the inland town of Lexington. That hustling place was even then a town of wealth, culture and beautiful homes. It is credited with the first college, the first newspaper, the first public library, yes, and the first insane asylum—although the lack of railroads is not held responsible for the latter institution. Howbeit, her citizens held, and rightly so, that her comparative isolation lay in the fact that the neighboring towns had access to a great waterway, while she had none.

While her progressive citizens were casting about for a means to overcome this natural handicap, they began to hear of the strides being made in the newly-discovered railroad locomotion then agitating England, and of the first experiments being made in America. At least three newspapers published in Kentucky—the *Gazette*, the *Observer*, and the *Reporter*,—were full of the new mode of transportation, and soon it became a favorite topic of conversation where two or three men were gathered together, displacing even the question of speed between two rival horses. So, you may see, these Kentuckians *were* interested!

Public meetings were held, and a representative was sent to England to study the new venture and report back. His report was so glowing that steps were taken at once to secure a charter from the legislature for a railroad. The charter was obtained without difficulty, on January 27, 1830, authorizing the Lexington and Ohio Rail Road Company to construct a road from Lexington to a point, unnamed, on the Ohio River. The capital stock was $300,000, and the next step was to secure subscriptions. Within five days after the books were opened, it was oversubscribed by $11,000, two-thirds of the required amount having been allotted the first day. An organization was effected immediately, Elisha I. Winter being elected president. Henry Clay was one of the directors.

Preliminary surveys were at once made, the roadbed being patterned after the English, in many essentials. An issue of the *Reporter*, in November, 1830, contains a detailed account of the work, together with a review of railroads in general, with a special tribute to the Baltimore and Ohio, then making its way westward. The article prophesied that the digging of canals in all parts of the country would cease, many of those then in use would be abandoned, and railroads be substituted. It described the excavating and bridging that was being done for the new road. "The engineers," said the writer in conclusion, "are of the opinion that it is throughout an eligible cheap line. The whole cost is less than $8,000 a mile."

The track was described as made of "large pieces of limestone, two feet or more in length and from three to twelve inches thick, made straight on the upper edge, firmly imbedded along the graduated road in two lines, four feet, three inches apart. On these lines of stone sills are laid iron bars or rails, two inches wide, one and one-half inches thick, fastened with iron bolts." The next issue of the paper corrected the thickness of the rails, to read half an inch thick.

The report of the engineer in charge of construction called for an inclined plane at Frankfort, about 2,200 feet long, descending one foot in fourteen; the rest of the line to be practically level. No cut was required deeper than nineteen feet, no embankover twenty feet high, and no bridge over thirty feet. So we can see that the construction was comparatively simple—nothing like that required to cross the Alleghenies. The report further stated that a single horse would be capable of hauling a weight of seven tons, with as much ease as five horses could now draw two tons over the dirt roads.

The road was to be run in two divisions: the first extending from Lexington to Villa Grove, a distance of six miles; and the second from Villa Grove to Frankfort.

The *Reporter*, which was known locally as "Clay's Organ," in its issue for April 20, 1831, gives an account of a typical stockholders' meeting, at which Clay presided. While he did not speak at length, President Winter did, giving glowing reports of the affairs of the road to that date, and ending by exhorting the stockholders to come forward with a sum not to exceed $150,000 to provide further sinews of war. A banquet was held that night at a local inn, with visitors from Louisville as guests, and it requires no stretch of the imagination to conjure to mind the flow of both liquid refreshment and fulsome oratory, which went hand in hand with many of those early railroad projects.

Naturally, also, there was an imposing laying of the corner-stone, this event occurring upon a late day in October, of the same year. The city was thronged with visitors. There was an elaborate parade of three military companies, with prominent

State and other officials; but the mayor and aldermen of Louisville, although invited, for some reason "did not come." The address of the day was delivered by President Caldwell, of the Transylvania Medical College, and was reprinted in full. I have recently seen a copy. The heights of oratory are unlimited, yet bespeak knowledge of the subject and prophetic vision as well; but one wonders where Henry Clay, the matchless "Mill-boy of the Slashes" was, on this auspicious occasion.

Mr. Caldwell's address, however, was masterly, and read in the cold light of a century later contains many sentences which bear repeating. He was still another of that far-seeing band of men who visioned the United States as a future world-power. And he spoke of Invention as the prime mover in this great transformation to be made in the not-distant future.

After referring to Fulton, and the conquest of the water, Caldwell turned his attention to "land passages": traveling, transportation, modes of conveyance, paved and graduated highways and the recent introduction of the railroad. Of the latter he said that "language scarcely enables us to speak extravagantly." He continues:

> "To pronounce the results sublime and wonderful is a form of expression free from hyperbole. The invention has already realized what fancy but ten years ago did not dare conceive. By means of it what was too bold for fiction then, is history now. Time and distance are vanquished by art; tens

of thousands of tons of merchandise and hundreds of thousands of human beings move as by magic between different places. And towns and cities which were once strangers to each other are all but converted into the same community. And land and labor and other forms of property in the vicinity of these improvements are quadrupled in value.

"Our own country is alive with enterprise and fired with enthusiasm on the same subject and in a few months a number of our roads will be in full operation. At present Pennsylvania, New York, New Jersey and Maryland are greatly in advance of other places. But the spirit of enterprise is extending and promises ultimately to pervade the Union. Let us for a moment suppose (what in coming years will certainly be effected), the system of Rail Roads completely federalized, branches I mean connecting the several states with each other, inferior ramifications extending from the large ones through the principal sections of each state and a main one connecting the whole with the Capital of the Nation. Let us prospectively, I say, contemplate such a scheme in active operation in the conveyance of passengers and transportation of merchandise; and let us further imagine the entire pageant to be visible to us at a single view. What other earthly exhibition of art could vie with it, in grandeur of appearance, power of performance and felicity of effect. Hundreds of thousands of human beings and millions of wealth moving to their various points of destination with unequalled magnificence and with the swiftness of an eagle sweeping through the heavens! Suppose us to be at war and four-fifths of these passengers to be sol-

> diers clad in steel with waving banners and gleaming arms rushing to the expulsion of any invading army! And such a scene may yet occur. But I must decline the attempt to finish the delineation. The spectacle is almost too bright and burning for the eye to look upon and too vast for the imagination to compass."

Surely this is not mere fulsome oratory; it is prophetic vision!

For a period after this celebration, however, there seems to have been a lull in activities, although grading still went forward. Then, a few weeks later, came an urgent appeal through the columns of the newspaper "for every man, who is a man and will act like one, to come forward and put his shoulder to the wheel. . . . If he loves money, this is the way to improve his fortune; if he loves his country, this is the sure way to advance her power and glory. . . . Come all—come quickly. Let us have no more theorizing, but in its stead, efficient action."

Apparently the necessary financial aid was forthcoming, for in August "a splendid car" which was called the "Lexington and Ohio" made two trial trips, carrying "inside and out" about sixty passengers. The following week, although but a mile and a half of road was completed, it was formally opened, the Governor again gracing the occasion with his presence. The car was drawn, by horses, with about forty passengers, at the rate of ten miles an hour. The enthusiastic editor of the journal said that the delight experienced at the sight was "sufficient of itself to repay the beholder for the trouble of a journey of fifty miles." He added that "a steam locomotive was being constructed to be placed upon the road as soon as the distance is opened on the whole of the First Division."

This locomotive was an emanation from the brain of Thomas Harris Barlow, known to fame as the inventor of the "planetarium," who collaborated with Joseph Bruen in the new creation for the railroad. A contemporary who saw the contrivance in later years said that it "was an odd concern; not more than three or four feet high, wheels, boiler, and all. The pistons worked perpendicularly; two cylinders and a tongue in front to guide the steam wagon with the necessary pilot wheel with its tiller ropes." As there were "many curves put in the track by the construction engineers, so that the conductor could see the end of his train now and then and be sure that all the coaches were there," we can readily understand why the *tongues* should be needed.

On the first of January, 1833, the local papers advertised the fact that: "six miles of road were now completed and a regular passenger train service inaugurated, trains leaving the Lower Market House in Lexington at 9½ o'clock A. M. and 2½ o'clock P. M., and returning would leave the end of the division at 10 o'clock A. M. and 3½ o'clock P. M. A horse and one passenger car were used and as an inducement to increased service it was stated that "companies of twelve or more" could be "accommodated with a Private Car by giving one hour's notice."

In a short time trains were put in operation and on March 2nd the new locomotive was given a try-out, and while the *Observer* of that date stated that hereafter it was to make regular trips on the road, yet how long it ran or just with what success we do not know. Apparently it did not measure up to expectations for there seems to be no record of its being put into actual service.

The road was formally opened to Frankfort on January 31, of the following year, when a new engine of "improved model" was used. This opening was celebrated by a grand ball, described as a most brilliant affair. These Kentuckians certainly knew how to celebrate, and who can estimate the amount of mint-julep consumed? To its mellowing influence was doubtless due many an added subscription.

The "improved model" locomotive was evidently not a huge success, as a writer for the Louisville and Nashville Railroad, to whom I am indebted for much of my information, states that steam locomotion was not put into service regularly until January, 1835.

The contemporary from whom we quoted the description of Barlow and Bruen's engine has left some interesting recollections of his sensations while riding upon one of these pioneer trains. He says:

> "I recollect distinctly the little locomotives, 'Nottaway' and 'Logan.' More than two-score times

have I and other able-bodied men gotten out of the passenger car when the locomotive was not able to pull the load over some slight elevation in the road, and pushed passenger car and engine up the inclined plane of less than one degree inclination. When we arrived at the summit of the inclination, which was about nine miles from Lexington in what was called the 'deep cut,' the engineer in the meantime having raised steam enough to carry passengers to the next slight ascension in the road, cried 'All aboard' and away we went. 'All out' was the engineer's next cry when he came to some slight ascension in the road. Out we came and our shoulders were again applied to help the little locomotive out of its terrible difficulty. Arriving at the top of the hill at Frankfort from a four to six hours' ride of twenty-four miles we met with two serious questions, either to go down the inclined plane at nearly 40 degrees inclination free of charge, or take the hacks and carriages in waiting by paying 25 cents extra. My old friend, Rev. Dr. R. J. Breckenridge, and myself not wishing to risk our lives on the inclined plane took seats in a hack. I recollect Dr. Breckenridge's remark, when he paid his extra quarter for hack hire: 'I agreed to pay $1.00 to be carried safely to Frankfort. I pay this additional 25 cents under protest as a swindle.' The driver 'took our monies and went his ways' and proceeded to collect 25 cents from each passenger going into Frankfort until some 'change' was made by the Directors of the Rail Road."

Many interesting items of this small early road are extant, but our space will permit only one or two more. The *Observer* chronicles two fatal accidents of the first months of operation; one being the death of a colored boy who was playing with others on the train, and this accident not being the fault of the road. The other was due to the loose coupling of the coaches, and their interior plan. The benches for passengers ran the length of the car, but others who were not lucky enough to get seats, stood in the center. By crowding, some fifty could be accommodated in each car.

On the occasion of the accident, the trip to Villa Grove was made in safety, but on the return the engine was placed at the rear of the train to push it up the grade. Just as it was rounding a sharp curve, the cars buckled and one of them jumped the track. "Some of the passengers on the two burthen cars attempted to jump off, the ground being nearly on a level with the road at that place; others, especially those standing in the forward burthen car were thrown backwards and knocked off, those near the edge of it under the wheels of the other; some attempted to leap on the bank, fell and rolled down, and thus all the mischief was done."

One gentleman was killed instantly; two others had a leg broken each; many of the other passengers were bruised and injured. One poor fellow, whose right foot had become fastened in one of the car wheels, would have lost his leg and probably his life if it had not been for the level-headed engineer who although under considerable headway for those days, stopped the train almost instantly. As it was, part of the car to which the wheel was attached had to be dismembered in order to release the passenger's foot.

The next issue of the local *Observer* in commenting on the occurrence said that "by proper management and strict attention" a future similar accident might be avoided and suggested that "the number of passengers to go in each car should be limited. Huddling numbers on the top is extremely hazardous." The other suggestion looked at possible future contingencies. "Unless a wire sieve is fastened over the top of the chimney of the engine we shall soon have some dwelling house, barn or other building near the road burnt down or the cars themselves set on fire."

After 1835 construction west of Frankfort lagged; all attempts to get Louisville, slated as the western terminus of the road, interested in the proposition failed, probably because of her advantageous situation on the Ohio River. Indeed for many years this road was commonly called the "Lexington and Frankfort Road."

Finally in 1847 a new corporation known as the Louisville and Frankfort Railroad Company was authorized by a special act of the state legislature to acquire the property, rights and privileges of the Lexington and Ohio road west of Frankfort. This new work was then prosecuted, but the line was not completed to Louisville until September, 1851.

And in 1848, the state, which through default of the Lexington and Ohio road had secured ownership of the latter in 1842, sold to a new corporation, the Lexington and Frankfort Railroad Company, that portion of the Lexington and Ohio which extended between Lexington and Frankfort. The new corporation rebuilt the road which was badly in need of repairs, and finished the reconstruction the next year.

In 1869, the Louisville, Cincinnati and Lexington Railroad acquired both of these roads, and, in 1881, the present Louisville and Nashville Railroad assumed control. To-day this little old Kentucky road is now a part of the great Louisville and Nashville system.

XI

A LITTLE-KNOWN RAILWAY OF THE FAR SOUTH

I MUST confess that in the preparation of this chapter I found much of interest. The little road under consideration has been overlooked by historians generally, and of those mentioning it its importance is belittled, possibly because of the short distance of the road; but, like the Lexington and Ohio, its story is redolent of the past.

The Pontchartrain Railroad, which linked up the city of New Orleans with Lake Pontchartrain, four and a half miles away, was not only the earliest road of this section, it was also the most successful. The promoters went after it in a business-like way; and the fact that New Orleans was one of our most important ports made its progress possible under auspicious skies. In fact, New Orleans at that time ranked third among the ports of the entire world. At her wharves were to be found daily the various craft from the Mississippi, the Missouri, the Ohio, and their tributaries, and in those days before the coming of the railroad to the Middle West, this commerce was vast indeed. Here also were coastwise craft, Gulf vessels, and ships from overseas flying every civilized flag.

To the north of the city lay the large inland body of water known as Lake Pontchartrain. It was connected with the city by a canal, and played no inconsiderable part in the commerce of New Orleans. The canal, however, was slow, requiring three hours for a trip; and the commercial leaders of the great Southern port were on the *qui vive* for something better.

As early as 1825 the question of a railroad was agitated. The *Louisiana Gazette* spoke of the railroad excitement in England, and suggested that a track be laid between the city and the lake. This idea seized the popular imagination, and street corners everywhere buzzed with the topic. To add to the interest, a resident of the city, Lambert by name, secured a patent on a "steam engine" which he had constructed, but which seems to have gone the way of many similar inventions; although the *Gazette* described it in glowing terms, as obviating "all the objections now made to the steam engine for locomotive power," adding that "there cannot remain a doubt that when he brings his improvement to perfection it will remunerate him immensely and will entail upon mankind the greatest obligation."

Upon the crest of public interest, the Pontchartrain Railroad Company was incorporated by an act of the State legislature, January 20, 1830. It provided for a road to run "from the city of New Orleans to some suitable point on Lake Pontchartrain or Bayou or other stream leading to said lake, not exceeding ninety feet wide, with as many sets of tracks as the said company may deem proper." The road was authorized to construct harbors, wharves, piers, and breakwaters on the lake, extending them as far as might be deemed expedient. The company was allowed to fix rates, but the passenger fare was limited to thirty-seven and a half cents each way; and freight fifty cents per ton, with the exception that building material and firewood be transported for thirty cents per ton. The capital stock was fixed at $150,000, with the privilege of increasing this later to $250,000.

In April of this year interest was still further stimulated by an exhibition of "a railroad and steam engine for three nights only," at the American Theater. This was not Lambert's invention, but seems to have been a success; certainly it was good propaganda.

The best account of this old road may be found in the first annual report, made in December, 1830, preserved in the minutes of the company. The Louisville and Nashville Railroad, which acquired the property in 1880, has kindly loaned the present writer these records. As they teem with interest, I ask the reader's permission to quote rather fully from them. It is an actual page from the life of one hundred years ago. I transcribe it literally, as to spelling and punctuation. The report is by the road's first president, Morris Hoffman, and is transcribed by R. Clague, the secretary. It reads in part:

> "The Enterprise may be considered to have originated in the connexion of the present Presi-

dent with the State of Maryland, and the City of Baltimore. The first movements as to the Baltimore and Ohio Rail Road Company were made in the year 1826. The connexion of the President with that State and City having produced a familiarity with the successive steps towards that undertaking, he was led to consider of the practicability and utility of a similar road from our city to Lake Pontchartrain. The whole community was apprised of the inconvenience attendant on the transportation by means of the Canal Bayou. Impressed with these considerations several gentlemen were spoken to, and a publick meeting was called to consider the subject in July, 1828. . . . A Committee was appointed to procure information from Baltimore and elsewhere,—and otherwise to investigate the practicability and utility of the undertaking, and were directed to report in the following November. Our President was a member of this Committee, and by correspondence and enquiry collected the information required. . . . By this time, the ardor of the gentlemen concerned in the first meeting had subsided, or their views had changed, and they declined to take the steps proposed. Thus the matter stood for some time, till our President and some of the other gentlemen fully impressed with the practicability and utility of the undertaking, and believing useless again to attempt *calling* together by publick meeting, proposed the formation of an association or society for the purpose of carrying into execution their views. . . . This Society met several times in the Spring and Summer of 1829. A small subscription was agreed upon, and our President being about to visit the Atlantic States to which he was in some measure induced by this object, he was requested and authorized to obtain all the information possible, consult the Board of Engineers of the Baltimore & Ohio Road, visit any works of the kind that were in operation, and make inquiry as to the probability of obtaining a competent Engineer to undertake the management of the enterprise. With these views he procured topographical maps of the country and also visited the adjacent swamps and shores of Lake Pontchartrain to possess himself of a personal knowledge of the localities. At this time, at the instance of the Society our President published a pamphlet giving his views of the subject and detailing the information he had acquired.

"Our President did accordingly visit the Quincy Road near Boston while in the Atlantic States,—he also saw General Bernard at Washington whose topographical survey of the Country made his opinion valuable,—and consulted and advised with the Engineers at Baltimore. These persons gave the Enterprise the sanction of their favorable opinion, and upon the recommendation of the Engineers of Baltimore, an engagement was made with General Swift formerly at the head of the Engineer department of the Government, and at that time in their employ, to come to Louisiana and examine the ground over which it was proposed to run the road, and also to decide on the practicability and mode of construction of a harbor in the Lake. . . ."

The report then recites the steps taken to incorporate the road and to acquire a right of way. The difficulties of the latter at the hands of private owners are told at length. It next continues:

> "Having thus acquired the route of the Road, the Directors considered a great point gained, and they felicitate themselves that neither in accomplishing this great object nor in any other of their subsequent multifarious contracts and engagements, has the Company been involved in litigation. That we may always be enabled to steer equally clear of this evil, is 'devoutly to be wished.' In the latter part of February the engagements of General Swift required his return to the Atlantic States. As it was understood that Gen. Swift was particularly conversant with the construction of Piers and Breakwaters, it was considered desirable to secure his services for the ensuing season for the general completion of the undertaking and more particularly in relation to these works. He was accordingly engaged to return by the 1st of November, 1830, for this purpose, and it was understood he was to bring with him a gang of hands accustomed to this species of work. A stipulated sum of Five Thousand Dollars was agreed to be given him for this service, and an assistant Engineer was to be provided for the intermediate time, to whom a salary at the rate of fifteen hundred dollars per annum was to be paid. As this gentleman was in the services of the Government at Fort Jackson, a furlough was to be obtained for him.
>
> "An application was made to our delegation in

Congress to procure some assistance from the Federal Government in the construction of the Harbor and Breakwater and to have it erected into a Port of Entry and Clearance, but neither of these objects is yet attained.

"Not to lose time it was determined to proceed with the work as fast as possible; overseers and men were employed; some of the Directors giving much of their time and personal attention to the details of the undertaking. The work was accordingly commenced on the 10th of March, 1830 (the first axe being that day struck into the first tree) and ably conducted under the Superintendence of Mr. Bozeman. Contracts were made, wherever it was possible, for digging ditches, cutting down the woods and clearing out the road. . . .

"A correspondence had been kept up with Mr. Francis B. Ogden, our Consul at Liverpool, with a view to ascertain the cost of iron rails in England, and any information which could be valuable to us, and Mr. Forstall, one of the Directors being about to proceed to England, he was charged, with the aid of Mr. Ogden, with entering into a contract for the purchase of rails and a locomotive steam engine. It was at first proposed to use the plate rail, but on the advice of Mr. Ogden, it was changed into the massive wrought iron rail.

"About the beginning of May it became necessary to determine the manner in which the road was to be carried over the two swamps. Various means had been suggested of using piles,—a bridge on log pillars,—and a causeway. The season and the opening of the road having left the swamps nearly dry, the Committee were led to believe that the swamps could be conquered by filling them up with a mound of earth without too heavy an expense. The advantages of this mode of making the road were obvious—it would be permanent, level and solid; and it was believed, would not cost much more than any of the other modes proposed. It was accordingly commenced. Twenty to thirty carts were employed in filling up with earth from the banks of the canal and the high ground of the Gentilly and Lake Shore, and on the 10th of June, 1830, the Directors had the satisfaction of seeing the whole route traversable by carriages from the city to the lake, and it was opened to the publick for the purpose of being consolidated by use. But, tho' thus made passable for carriages, it was obvious that much labour and expense were still necessary, particularly on the lower swamp, to raise it sufficiently high (nearly three feet) to be above the greatest height of the water in the swamp, and to a level with the shell bank of the lake; accordingly the months of June, July, August, September and October were employed in this work, and the Directors are fully satisfied of the firmness and solidity of the foundation thus made. During this period also a very large quantity of timber was obtained from the adjoining swamp. A small part of the timber contracted for arrived, and was hauled on the levee, as was also a large cedar raft which had been purchased. The quantity of timber necessary may be imagined when the stockholders are informed that the sills or sleepers on which the string pieces of the road rest, are only five feet apart from center to center. These with the string pieces for a track of five miles, composing a quantity of 100,000 feet of timber, were got out, distributed along the road, and a considerable part of them hewed and prepared during the summer. A person was also employed to finish the wharf at the lake. This it was proposed to construct for the first 400 yards, of a mound of earth, sand and shells;—and the rest of the distance on piles or piers, as should be found advisable. Accordingly a mound has been carried one hundred and fifty yards into the lake, and timber and side pieces were carried out and driven in part for about 400 yards. When this part of the undertaking had progressed thus far, the person who had charge of it died, and the whole work received a check by a considerable mortality among the hands, who could not be restrained from entering the city.[1]

"From the experience of the Baltimore and Ohio road, it has been considered expedient to use horses rather than steam engines on the road in the first instance. A velocity of twelve miles per hour can be attained with horses. The order for the engine was countermanded but it is doubted if the letter conveying the countermand will arrive in time.

"On the 1st of November, 1830, General Swift arrived with the hands engaged by him under a contract sanctioned by the Board. Since that time they have been steadily employed in dressing sills and string pieces. The number of hands now employed on the road is about 140. The work has

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[1] It is possible that an epidemic of either yellow fever or malaria may have broken out.

> been placed under the charge of the Engineer, who gives us full assurance of its early completion.
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> "Unless wholly interrupted by weather or other unavoidable accident, the Directors see nothing to prevent the completion of the road by the beginning of March, or at latest April, and of the harbour and breakwater by the 1st of May or at latest June. The laying of the sills and string pieces commenced on Monday last and it goes on at the rate of 80 yards per day which will soon be increased."

After showing the immediate benefits to be derived from the new road as a hauler of freight, the report concludes:

> "These facts are better than volumes of speculation. The wonderful success of similar undertakings in England and in the Atlantic States loudly encourage us to proceed. If R. roads are to succeed anywhere, it is on short distances near large cities. One is constructing between Baltimore & Philadelphia: another between Philadelphia & New York; another between Albany and Schenectady. Application is advertised to be made to the Legislature of New York for one from Utica to Albany, and one is constructing from Augusta to Charleston. Under these circumstances, it would be surprising if a short road from N. Orleans (visited by so many strangers) to the lake, a place of great resort for pleasure, and on which so much business is transacted, should not afford a profitable investment."

Like all similar undertakings, the formal opening of the road was attended by ceremonies befitting the occasion. This took place on April 23, 1831, and was participated in by the governor, members of the legislature, local officials and other dignitaries. After the street parade—and what city knows how to hold a street parade so well as New Orleans?—the dignitaries entered the cars standing upon the track, and attached to horses. The one leading the van bore the name of "Louisiana," and held about thirty. The journey to the lake and back was made quickly and successfully, and was wildly acclaimed.

After a regular schedule was established, trains left the city every afternoon except Sunday, on one and one-half hour trips. On Sundays they ran all day, evidently as pleasure excursions. The "de luxe" car, "Louisiana," could be obtained only by special arrangement. Meanwhile, until turn-outs had been constructed, no attempt was made to haul freight.

In June, 1832, a locomotive constructed by a John Shields, of Cincinnati, arrived on a steamboat and the interest of John Grant, superintendent of the road, was enlisted. As no one competent to run the engine could be found, Grant tried his hand at the throttle, but the experiment was a failure. This was a great discouragement to Shields, but Grant gave him a thousand dollars for the engine and used it in the shops to run one of the lathes.

Like the other early roads, the officials now wished to do away with horse-power and ordered a locomotive from England. This was called the "Pontchartrain," fittingly, and, September 17, 1832, after trial trips, the first regular run was made. The new "steam car" as it was called, was attached to a train of twelve coaches, holding over 300 people, and the run was made from the city to the lake successfully to the blare of the bands and the cheers of the people.

At the lake terminus the enthusiastic passengers repaired to the Washington Hotel, where on the second floor a lunch was served, while some of the hardier spirits, on the ground floor, in order to "counteract the effects of the drenching rain" which had been in evidence all day, "drank success to the 'Pontchartrain'" in various kinds of beverages containing more than the now legal one-half of one per cent alcohol. One of the amusing incidents of the run to the lake was the manner in which some of the colored slaves on one of the plantations through which the road ran viewed the innovation. As the strange apparition approached with its various kinds of unearthly noises, they ran pell mell from the spot, supposing that it was some ethereal or infernal visitor.

But with such an auspicious beginning, disasters began to follow the advent of the new power. Three days after the trial trip the new engine, pulling a passenger train, collided with a cow on the tracks and was upset into a ditch. Shortly afterwards a negro boy was killed and later, when a group of distinguished passengers among whom was a local editor noticed sparks from the engine setting fire to the coach in which they were riding and igniting a suit of clothes of one of the party, vigorous protest was made. Some means to overcome the spark danger were urged on the officials.

As an interesting side-light, the writer is informed that at the time the original promoters were deliberating in 1825, they seriously considered whether passenger cars should have springs or merely rest upon the axles.

As already stated, at the lake terminus a hotel and town were laid out, and this was called Milneburg in honor of the previous owner of the land. Milne was reported as being one of the wealthiest men of his day and was a philanthropist. The old Washington Hotel surrounded by the Washington Gardens was a famous hostelry in its time. It was in existence until about ten years ago and for a half century after its construction was a gathering place for the élite.

At one time Thackeray dined there and afterward wrote of the occasion: "At that comfortable inn in Pontchartrain we had bouillabaise than which a better never eaten at Marseilles, and not a headache in the morning, upon my word, on the contrary, only awoke with a sweet refreshing thirst for claret and water."

Later a short extension of track was made and the company was authorized to increase its stock to $750,000. This extension, lying between Girod Street and Elysian Fields, was sold to Charles Morgan in 1872 to be incorporated in his Louisiana and Texas Railroad, while the original Pontchartrain

Railroad in 1880 passed into the hands of the present Louisville and Nashville Railroad, at the same time it secured control of the New Orleans, Mobile and Texas Railroad.

Short as it was, however, the little Pontchartrain road was the pioneer in its Southern field, and hence a maker of history.

XII

PIONEER ROADS OF THE SOUTH

The South Carolina Railroad

EARLY interest in railroads was by no means confined to the East—as we have just seen in our sketch of the Pontchartrain Railroad. All along the Atlantic Coast the cities were on the alert to solve that pressing problem of freight connections with the interior. Every port knew that its future salvation depended upon its ability to tap the back country.

Charleston, South Carolina, was an instance in point. In the twenties it saw its business gradually declining for various reasons, but mainly because the inland chain of towns "extending across the state from North Carolina to the Georgia boundary line" were intercepting the trade, of which it had formerly held a monopoly. One energetic writer in 1827 said that, "If we act wisely, we may secure the entire wholesale trade of these towns, as well as that of the adjoining States. But to do this we must rouse our sleeping energies, and instead of supinely bewailing our fallen condition, put our shoulders to the wheel." He as well as other agitators advocated the canal as a means of transportation, and a coterie of prominent business men, in December of that year, petitioned the legislature for power to survey the region lying between the Ashley and Savannah rivers for a canal; and that lying between Charleston and Augusta for the possibilities of a railroad.

The advocates of a railroad seem to have been more active than the canal devotees, for immediately a Charleston representative, Alexander Black, presented a bill, which was enacted into a law, providing for a railroad between Charleston and the inland communities of Camden, Columbia, and Hamburg. It was one of the very earliest pieces of railroad legislation in the entire South. The charter was granted, on January 30, 1828, to the South Carolina Canal and Railroad Company, but it was known as the Charleston and Hamburg road.

Several early attempts at Federal aid met with failure, but the services of Army engineers were promised to supervise the construction. And right here the matter of "States' Rights" raised its familiar and ugly head. A contemporary paper of Athens, Georgia, well stated the case of the "conscientious objectors" in a bristling editorial.

> "The South has thus far," it said, "kept aloof from all participation in the pecuniary gifts and loans of the Federal Government. Our hands remain untainted with these indirect bribes—we have always opposed them when extended to others, upon principle—and we are sorry to see agents from South Carolina—men of standing—members of the legislature—knocking at the doors of Congress and with cap in hand begging a portion of the treasury scraps. Still more should we regret

> to see them succeed. . . . And it will be a most pernicious example to our younger sisters of the South. If we ever hope to bring Congress to a rigid adherence to the letter of the Constitution, and prevent them from assuming every power by construction, we should abstain from all participation in the unholy thing; and instead thereof steadily assert our principles, and show by our example that we really believe, and wish to establish, what we are contending for."

This antagonism on the part of sister states may have been due in part to jealousy. At any rate, South Carolina at this time was willing to play with the Federal Government, and engineers were sent down. In their first report they advocated two unwise propositions: a piling system for the roadbed, instead of embankments and trestles; and a route which followed the line of least resistance. The former was adopted at a great loss to be demonstrated later when the decaying wood had to be removed; while the latter was remedied when a new engineer appeared upon the scene—none other than the able Horatio Allen, the Delaware and Hudson engineer whose career we have previously traced.

Allen took charge in September, 1829, and under his survey fourteen miles was cut off the original line, and estimates and contracts speedily let. Within a twelvemonth six miles of track had been laid, and a wheezy, puffing steam engine was traversing it, to the amazement of the onlookers, white and black. This locomotive, christened the "Best Friend of

Charleston," was built at the West Point foundry, above New York, and reached Charleston by water on December 9, 1830. Its coming was a momentous occasion, and the crowd was almost delirious with delight when, a fire having been built under its diminutive boiler—*it ran!* Charleston citizens at once had visions of hundreds of miles of track leading in every direction and all bringing the products of the southland to their beloved port.

Some amusing tales are told of the "Best Friend's" first runs. One planter from the interior who had not heard of its coming was driving along the track with his team of mules. As the train approached, the mules became unmanageable, ran away and wrecked his wagon. As he was helped to his feet a solicitous inquirer asked why he didn't hold on to his team.

"Hold on?" repeated the native. "How the devil could I hold on, when I saw hell in harness coming down on me!"

The train kept in operation for some months, hauling sightseers and freight, until an unfortunate accident put the "Best Friend" into the discard. It was all on account of a negro fireman who tried to hold the safety-valve down by sitting on it. He was the forerunner of others who were to try the same stunt on the racing Mississippi steamers. Rastus, it seems, was temperamental and became annoyed at the sound made by the escaping steam from the valve. He stopped it—temporarily—by holding down the lever. A minute or so later there was a huge explosion and bits of the boiler accompanied the astounded negro for a distance of twenty-five feet. The negro's broken bones were patched up, but the engine received fatal injuries.

About this time, a second engine, called the "West Point," was put in service, and the following month an advertisement in a local paper stated that it ran "every day for passengers, at half past four P. M. Parties wishing it at any other hour can be accommodated by applying to the Engineer."

For some reason, local labor, even slave, was scarce and it was necessary to import help from the North or over sea. By September, 1833, however, the road was completed to Hamburg, the very respectable distance of 136 miles. There was one inclined plane operated by a stationary engine. When, the next month, the complete line was open, the entire railroad world marvelled. It was, in fact, the longest line then in operation anywhere. It had cost almost a million dollars, but it put Charleston back on the map as one of the most important ports in the country.

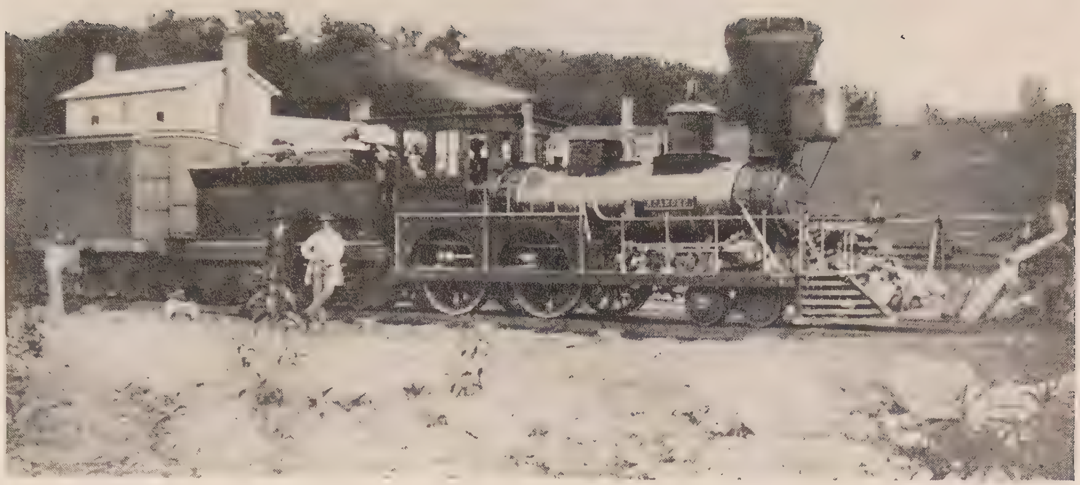
After some years of operation the Charleston and Hamburg became merged with other lines. It is now a part of the Southern Railway system.

The Atlantic Coast Line

The Atlantic Coast Railroad had its origin in the Petersburg Railroad, which was incorporated February 10, 1830. This road extended from the Virginia town of Petersburg to Weldon, North Carolina, sixty-one miles. Six years later, the Richmond and Petersburg road, twenty-three miles long, was given a charter. Other early roads sprang up forming a chain called the Great Atlantic Route, and leading all the way from Richmond to Charleston, South Carolina. They were under various companies, and had the further handicap of two different gauges. North of Wilmington it was the standard four feet, eight and a half inches; south it was five feet. Consequently a crude method was employed here of changing the trucks under the cars. As late as 1886 this cumbersome system was followed, at which time the standard gauge was substituted.

One unfortunate passenger who went over the lines in 1840 has left his account of the journey. He was a preacher hastening to New York to a sick wife. He left Montgomery, Alabama, after midnight, June 28, going to Columbus, Georgia, by stage—an arduous trip of about eleven hours. Traveling all that night and the next day by stage he reached Greensboro, where he put up for the night. The following morning he went by rail to Augusta, where he arrived in time for dinner. The next day a train conveyed him to Charleston, where he took a steamboat for Wilmington; and there a train for Weldon. This part of the trip he found "pleasant traveling during the day." It was over the Wilmington and Raleigh road and with its 161 miles of trackage it was said to be the longest line in the world.

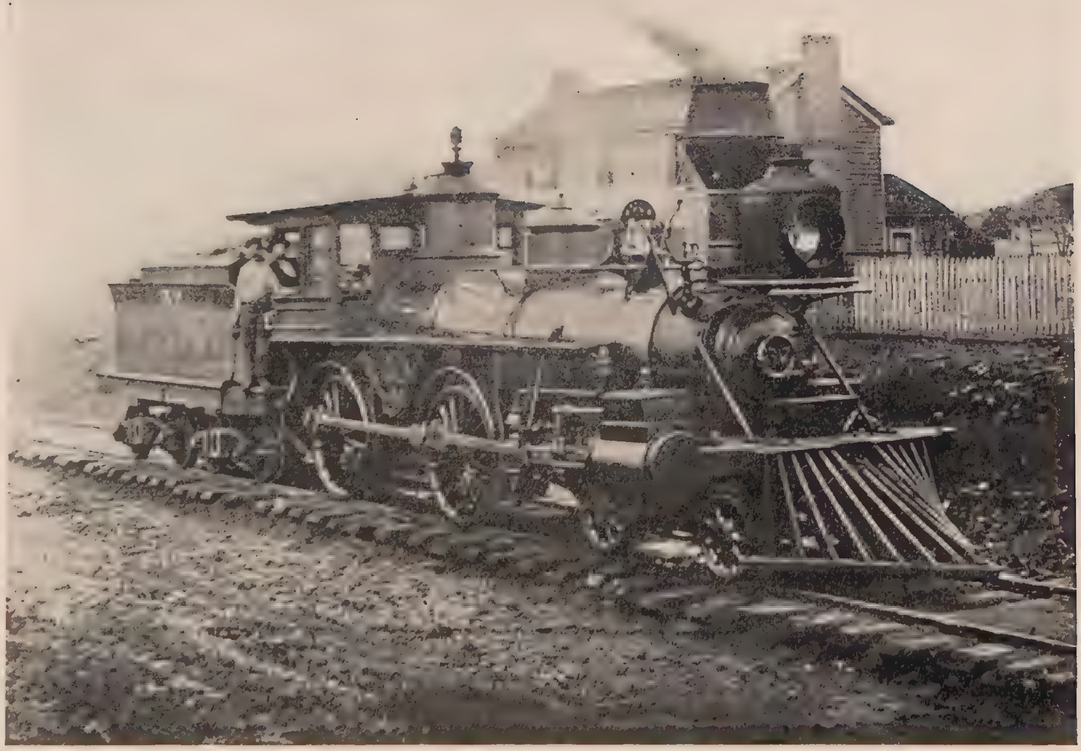
Leaving Weldon on the night of July 3 over the Petersburg Railroad, our tourist reached Baltimore



Courtesy, Norfolk and Western Railway

AN OLD WOOD-BURNER

Type of engine used in Virginia, in 1858



Courtesy, Norfolk and Western Railway

AN OLD WOOD-BURNING ENGINE

Used in the year 1873 on the Atlantic, Mississippi, and Ohio Railroad, which was a predecessor of the Norfolk and Western Railway the next day—only to learn that his wife had passed away two weeks before. He had been on the road by stage, steamer, and train from one-thirty Monday morning until six Saturday evening—a week of jogging, changing, and discomfort, only to learn that his errand was fruitless. To-day, as the Atlantic Coast Line points out, one can go from Baltimore to Montgomery in twenty-four hours, with practically all the comforts of one's own home.

It was not until 1898 that the Petersburg Railroad and the Richmond and Petersburg Railroad were consolidated into the Atlantic Coast Line Railroad of Virginia. Other independent lines were merged into the Atlantic Coast Line Railroad of South Carolina. In 1900 these corporations merging with others formed the present Atlantic Coast Line. Extensive work has been done by this system in the South, one of the latest being a modern double track between Richmond and Jacksonville, Florida. It is stated that from the end of Federal control, in 1920, up to the beginning of 1927 an expenditure of over one hundred millions of dollars had been authorized. But that is Twentieth Century railroading!

The Seaboard Air Line

When in the year 1832 the promoters of the little line running from Roanoke to Portsmouth secured their charter, they could not visualize the great system known as the Seaboard Air Line, with its four thousand miles of track. They were only concerned with the building of a line from Portsmouth to Weldon, a distance of seventy-nine miles. That, however, was a bold undertaking, the line was much longer than the average of those days, and the project required "prayer and fasting."

The chief engineer who was called in was Walter Gwynn, later a general in the Confederate Army. His official report, kindly sent to the present writer by the Seaboard management, is illuminating in its details.

> "The line which I have selected as the basis of my estimate," he wrote, "commences at the intersection of the western boundary of Portsmouth and the center line of High Street, and proceeds over an extremely level and unbroken surface to an eligible site for crossing by bridge a branch of the Nansmond River, a few hundred yards north of the termination of the Dismal Swamp Land Company's canal. Thence continuing to the line to Suffolk several spring branches are crossed, requiring the construction of small stone drains and some heavy cuttings and fillings. After leaving Suffolk the character of the country changes and becomes somewhat bold and in order to diminish the quantity of excavation and embankment several undulations in the plane of the railroad are unavoidably made; the inclinations are, however, gentle and the line reaches Blackwater without encountering any other difficulties than an increased expenditure on this position of it. From Blackwater, a level is maintained some distance, the line passes along the borders of the swamps, which

make up the highlands, and crossing the Nottoway on the lands of Mr. Rochelle about seven miles below Jerusalem it ascends at the rate of twenty feet per mile, passing near Mr. Gurley's to the Cypress Bridge road. Thence leaving Vick's Chapel a little to the south, and making a slight undulation to avoid some filling the line arrives at Capt. Barn's quarter on the summit of the ridge dividing the waters of the Nottoway from Meherrin.

"From Capt. Barn's descent is effected on a grade of twenty feet per mile to Buckhorn Run. Thence the line is continued on a level, across the Meherrin, about a mile above Branch's Bridge. It then ascends, varying from an inclination of twenty to twelve feet per mile until the summit of the railroad is attained, giving an elevation above the level of tidewater of 144 feet.

"Descending from the summit, the line crosses the Petersburg railroad (on a level with that road) about 300 yards south of Capt. Garey's. It afterwards crosses the head of Racoon Swamp and terminates on the north bank of the Roanoke opposite Weldon.

"Its direction is S. 70.2 and its length seventy-seven miles, being only half a mile longer than the distance on a direct line between Portsmouth and Weldon.

"The engine which it is proposed to use will not exceed five tons weight, and its performance on this road will be equal to that of a six ton engine on a road with thirty feet grades. From this general view it will be seen that the face of the country is eminently suitable to the proposed work. The intervening swamps and alluvial bottoms of the Nottoway, Blackwater and Meherrin offer no obstacles. The bottom is everywhere composed of solid materials, affording a firm foundation for any embankment or other structure it may be necessary to place on it."

We have quoted rather fully from the introductory data of Engineer Gwynn, to give the reader an idea of some of the problems confronting the early engineers in the new proposition of railroads. Gwynn also devotes space to discussing the mode of construction, the road-bed, kind of ties and rails to be used, width of track, bridging of streams, etc. And he shows himself a level-headed engineer at that, with his advocacy of wood ties rather than stone, iron rails two inches wide and half an inch thick, and width of track four feet eight and one half inches, the standard gauge to-day. But to-day it reads rather strangely when he speaks of the "sills" being "hollowed out in the middle so as to admit of the construction of a path over them which will adapt it to the use of either horse or locomotive power, or both."

Construction was commenced in 1833 and finished in 1836. A ten-ton engine, called the "Raleigh," imported from England, was put in service.

Owing to the sparsely settled country and cost of maintenance, the road did not pay and, in 1840, a part of it was discontinued. Six years later, the Board of Public Works sold the property under foreclosure at auction, buying in the portion which lay in Virginia. Later in the same year the control passed into various hands, the last purchaser being the Seaboard and Roanoke Railroad Company. The latter organization, far from being discouraged, at once started to expand and build additional lines. These were completed in 1851, and from that time until 1893, when the present Seaboard Air Line secured control, the road was run successfully and continuously.

Minute books of the Seaboard and Roanoke, which are still in existence, show that during the Civil War an interesting state of affairs existed. One set shows that while the president of the road and a minority of the directors were holding meetings in Richmond and declaring dividends paid in Confederate money, another book demonstrates that the secretary and treasurer and a majority of the directors were holding meetings in Philadelphia and declaring and paying dividends in United States money.

Reminiscences of one of the officers of this same road during the post-Civil War period are interesting as affording a glimpse of railroading as it was done then.

The freight cars had a maximum capacity of 24,000 pounds, and each railroad had its own locks for its cars and forwarded the keys to the connecting lines in quantities. Of course the local agents and freight conductors had their own keys. The method of coupling was the old shackle and pin, and the passenger cars were equipped with hand-brakes. Within the twenty-four hour period but one passenger train and two freight trains were run between

Raleigh and Weldon. At Kittrell, North Carolina, was located the first winter hotel operated for tourists in the Carolinas, and the New England manager had a house full every season. The visitors indulged in horseback riding, fox hunting, quail shooting and kindred sports.

Another pioneer road of the South, now a part of the Seaboard system, was owned by a Florida company, called the Tallahassee Railroad. It was incorporated in 1834 to run from that town to Port Leon, a distance of twenty-two miles. The road was pushed rapidly to completion and opened in 1836. According to President Warfield of the Seaboard, who has kindly supplied the bulk of the data used in this sketch, records are still on file in their traffic department concerning their "slave account." Apparently the railroad had its own slaves at this time.

Still another link of the Seaboard Air Line was the Raleigh and Gaston Railroad, chartered by the State of North Carolina, in 1835, for a route between the two points named. It was opened in 1840, and operated for over fifty years, or until 1893, when the Seaboard acquired control. It should be explained that from 1893 to 1900 the Seaboard had no corporate existence, it being an association of five different lines. In the latter year the Seaboard Air Line Railway became an entity.

The Norfolk and Western

In seeking out the first tender shoot of the present Norfolk and Western system, with its 2,300 miles of line, we must go back to the City Point Railroad, of 1836. Then a charter was granted by the Virginia legislature, to construct a road from the city of Petersburg to a place on the James River at or near City Point.

In April of the following year digging was commenced, and by December three-fourths of the work was completed; the entire length of the road being about ten miles. The first annual report spoke of the iron material having been purchased from England. The building of a wharf at City Point was also proposed, which would "admit vessels of the largest class, alongside, that reach City Point, together with suitable cranes for effecting the transition of produce and goods between the cars on the road and the vessels."

The report for December, 1838, showed a total of twelve officials and employees on the roster; a superintendent and agent of transportation, an engineer, a captain of the train, an overseer of the road, a fireman, one watchman, and six laborers. The rolling-stock consisted of two six-wheel locomotives, valued at over $13,000; 28 four-wheel freight cars; one eight-wheel, and two four-wheel passenger cars.

But as the case with many pioneer roads, the financial bugaboo began to rear its head, and the report for the year 1839 showed a new president at the helm who, while he spoke regretfully of the "cost of work and improvement" having been "unnecessarily great from causes difficult to state accurately," yet he believed that the Board of Directors were not "intimidated by this unlooked-for cost as to its final success . . . they confidently hope and believe that by economy and well-directed diligence the affairs of the Company will recover from embarrassment."

The reports for the next few years show that the road was hard pressed, although one deal was consummated which helped the situation somewhat, the purchase of the Petersburg Towing Company, operating upon the Appomattox River—a concern which had been a thorn in the side of the railroad. The equipment consisted of steamboats, lighters, and "arks."

In 1842, a third president pointed out a pressing debt which must be met. It was, said he, "for the best locomotive of the road, owned at present by Messrs. James, Morson, and Spencer, of Petersburg, who are bound for the payment of $3,000 on the first of March next, to Mr. Norris, who released the engine to them for their bond, and unless this can be paid against this day, these gentlemen may be under the necessity to make sale of the engine, *which would put a stop to the road.*"

And while a glimmer of hope was raised by the alleged discovery of "new and valuable coal mines" near Petersburg, "350,000 bushels" having already been mined since the discovery with "additional shafts being sunk," yet the recent historian of the road says that "no further mention is made of these coal mines or any traffic from them." And in 1846, a new president having taken the throttle, he said in giving an account of his stewardship that "the report contains but little of a gratifying character, either as it regards the business of the road or its present condition." All high expectations were "daily diminishing" and "with the prospect before the company, under such circumstances, entirely unable to prop its credit by the smallest reduction of their heavy debt, and equally unable to renovate the road or keep it in proper repair, the period cannot in all probability be far distant when their affairs must be wound up and the road and property fall into other hands or go down altogether."

The next year the blow fell, the Corporation of Petersburg acquiring possession of the road. Reorganized as the Appomattox Railroad, this in turn became the property of the South Side Railroad in 1854, and finally in 1881 it became a part of the present Norfolk and Western system.

In passing it should be noted that, in 1864, City Point, with this line of railroad, became a base of supplies for General Grant's army, the headquarters of Grant being located here, the chimney of the building being all that now remains.

The Norfolk and Western management state that until 1915 a light traffic was handled on this branch, when the Dupont people erected their munitions plant and the town of Hopewell was established. Almost immediately the traffic became so enormous that the following year a second track was laid, the year 1918 being the banner for freight business handled over the City Point Branch, when two hundred thousand tons of freight were moved over its tracks.

When Camp Lee was established during the late World War the main entrance thereto was by way of the City Point Branch, although the main line of the Norfolk and Western also provided a track connection, and the official records of the latter road show that in 1917 over a million and three quarters of passengers traveled over this line.

If the harassed officials of the original line could have foreseen these later tidal waves of prosperity, it might have heartened them to carry on; and again it might have made them "quit cold."

An Early Mississippi Road

Meantime, away down in Mississippi they were not idle. As early as 1831 we find the state legislature granting a charter to the Clinton and Vicksburg Railroad Company, to construct a line between these two points, a distance of thirty miles. It was to be used to haul cotton to the river, and to do away with oxen, then the motive power. The project was both for the purpose of getting the freight across quickly and to save the beasts of burden. The roads were so "dreadful," according to one writer, and "so many oxen perish in the yoke in winter and spring that . . . one might walk on dead oxen all the way from Jackson to Vicksburg."

Two years later the first spade of earth was turned, but conditions were such that by the latter part of the year the original corporation was succeeded by the Commercial and Railroad Bank of

Vicksburg, chartered to construct a road from Vicksburg to Jackson and carry on a banking business.

When four more years had rolled around, several miles had been built, and in 1838 a steam locomotive, called the "Commercial," a product of Baldwin of Philadelphia, was ready for trial.

In constructing the road slave labor was used almost entirely and what were termed great engineering difficulties had to be overcome. What with high trestles, deep cuts and a long bridge across the Big Black River, construction progressed slowly.

However, on May 15, of that year, the Commercial made her first regular trip from Vicksburg to a point five miles east, and on November 1st a regular service of two daily trains was established between Vicksburg and the Big Black River.

The bridge across this river was completed early in 1839, and the first train was run as far as the Edwards Plantation, 18 miles from Vicksburg, a few months later. The road-bed was similar in construction to other early roads, and we are informed that the spikes holding the iron straps to the wooden rails "worked out of the rails to such an extent that it was necessary for trackmen to make daily trips over the line to drive them in."

By 1840 the road was completed to Jackson, and a contemporary advertisement states that the round-trip fare for 45 miles each way was $8, or over eight cents a mile.

A connecting line, the Jackson and Brandon, was opened up about this time. In 1846, the Southern

Railroad Company was chartered with the idea of building from Brandon to the Alabama line. They acquired the Brandon line in the early fifties and even conceived the ambitious project of a road running across the continent from Charleston to San Diego, but nothing was actively done about it.

After many vicissitudes these early Mississippi lines passed into the control of the Illinois Central system. Extending by this time from Meridian in eastern Mississippi to Lorraine, Louisiana, on the Texas boundary, they made a continuous route of 330 miles.

XIII

THE ILLINOIS CENTRAL RAILROAD

In my former book on "Lincoln and the Railroads" I have quoted the familiar statement that the "history of the Illinois Central Railroad is the history of Illinois." The development of the one is coincident with that of the other. A special chapter is devoted to this road in the "Lincoln" book, for the further reason that his life story also parallels it curiously for many years. Lincoln was one of a group of callow lawmakers who ran the young state deeply into debt in a perfect orgy of railroad legislation; and he was as deep in it as the next man. Later as a successful lawyer, the Central was one of his main clients—but that is another story.

While the actual history of the Illinois Central begins with its incorporation, in February, 1851, its inception can be traced back fifteen or twenty years earlier. To quote from my former work: "The idea of a railroad as a highway to connect the northern and southern parts of the State seems to have been first suggested by Lieutenant-Governor A. M. Jenkins in 1832, his proposition causing considerable discussion. Three years later, Sidney Breese, known as the 'Father of the Illinois Central,' disseminated his views as to a combination of internal improvement schemes, which included the building of a railroad. Several newspapers also took up their cudgels in favor of the project, notably the *Sangamon Journal*, a paper of influence in early Illinois history. Finally, on January 18, 1836, a year before the notorious internal improvement legislature passed its budget, the Central Railroad Company was incorporated to construct a railroad from 'the mouth of the Ohio to a point on the Illinois River at or near the termination of the Illinois-Michigan Canal.' "

It remained, however, for the legislature of 1837 —of which Lincoln was a member—to set the wheels of future railroads rolling with a vengeance. It actually appropriated over twelve millions of dollars for internal improvements—and this when most of the state was little more than a wilderness. The largest single appropriation, $3,500,000, went to the Illinois Central.

This measure, known as the "Internal Improvements Act," passed in February, 1837, called for a network of intersecting lines. First there was to be a railroad from Galena, in the extreme northwestern part of the State, extending southward through Springfield to Cairo, in the southern extremity. Three roads were to radiate from Alton, above St. Louis: one to Shawneetown, on the Ohio; a second to Mt. Carmel, on the Wabash; and a third easterly toward Terre Haute, Indiana. These were by no means all the roads outlined in the Act; and in addition, the huge sum of $4,000,000 was appropriated for the Illinois and Michigan Canal, as well as other sums for the dredging and deepening of several streams.

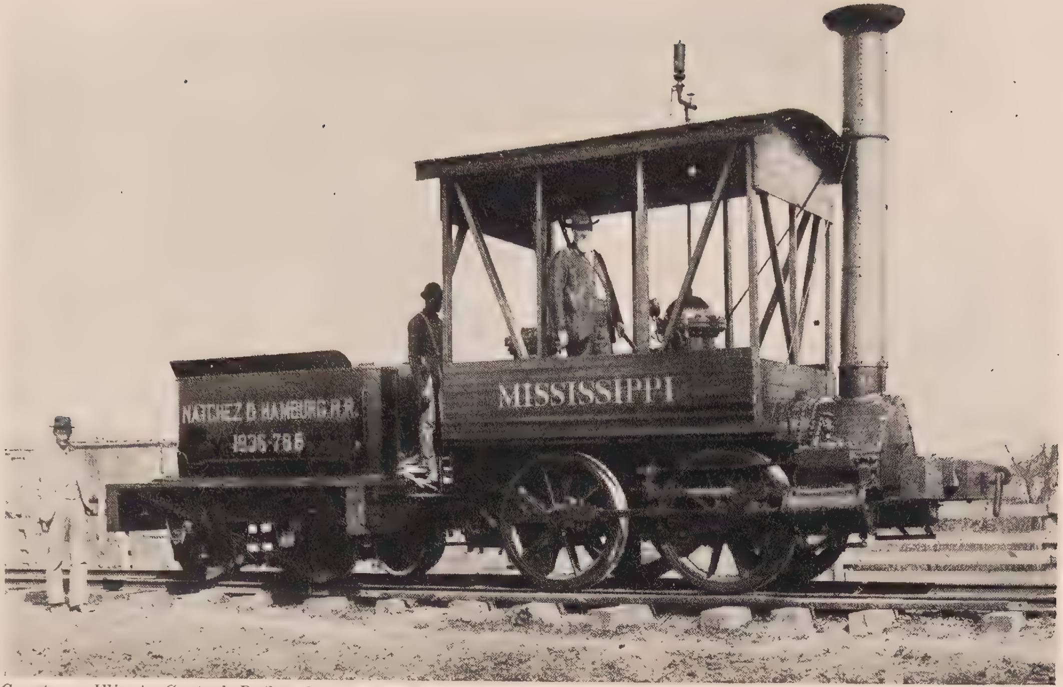
> "These sums," say Nicolay and Hay, in their biography of Lincoln, "monstrous as they were, were still ridiculously inadequate to the purpose in view. But while the frenzy lasted there was no consideration of cost or of possibilities. These vast works were voted without estimates, without surveys, without any rational consideration of their necessity. The voice of reason seemed to be silent in the Assembly; only the utterances of fervid prophecy found listeners. . . . The process of reasoning, or rather, predicting, was easy and natural. The roads would raise the price of land; the State could enter large tracts and sell them at a profit; foreign capital would be invested in land, and could be heavily taxed to pay bonded interest; and the roads, as fast as they were built, could be operated at a great profit to pay for their own construction. The climax of the whole folly was reached by the provision of law directing that work should be begun at once at the termini of all the roads, and the crossings of all rivers."

Hard upon the heels of this legislation came the great nation-wide panic of 1837, and the state, or rather its legislature, found itself as full of financial worries as the proverbial hound dog with fleas. Opposition naturally developed in many directions to the voting of funds, which they didn't have, in such lavish fashion. "Finally in 1840" (to quote again from my "Lincoln" book) "two acts were drawn up and passed which stopped all railroad work in the state. Up to this time, after all this blowing of horns, only twenty-six miles of railroad, and one hundred and five miles of canal, had been constructed, and this included work done on the Illinois and Michigan Canal before the wholesale legislation had been enacted."

The next effort was on behalf of a road known as the "Great Western," which was chartered in 1843; but this, too, came to naught. Then Stephen A. Douglas, the "Little Giant," rival of Lincoln and a stalwart advocate of internal improvement, was sent to the United States Senate. Through his and other efforts a Federal land grant was passed, which helped all later railroad legislation.

One of the first fruits of this grant was in 1851, when the Illinois legislature gave a charter to the Illinois Central Railroad Company, and conveyed to it 2,500,000 acres of public lands allotted to the state by the Federal act. It was, in fact, the very first of the land-grant railroads, and the terms specified that the main line should be built within four years.

Colonel Roswell B. Mason, of Connecticut, later a mayor of Chicago, was appointed chief engineer of construction, of what the Eastern papers called "the largest railroad in the world." Grenville M. Dodge was one of his assistants—the same Dodge who became one of the pioneer Rock Island surveyors, famous general in the Civil War, and chief engineer consulting with President Lincoln in the first



Courtesy, Illinois Central Railroad

THE "MISSISSIPPI"
A pioneer locomotive built in 1834 for the Natchez and Hamburg Railroad, in Mississippi

Courtesy, Illinois Central Railroad

A MODERN RAILROAD BRIDGE

Structure over a mile long spanning the Ohio River, at Cairo, Illinois great road across the continent. In a word, Dodge was one of the greatest railroad men who ever lived.

The first difficulty experienced was in securing a right of way into Chicago, and it was not until the middle of 1852 that a city ordinance was passed permitting construction along the lake-front. When we view the vast network of lines running into Chicago to-day, it is hard to realize that, seventy-five years ago, the first roads had to fight so hard to get a toe-hold.

At this time the Michigan Central and the Southern Michigan, both of which are now a part of the New York Central system, were engaged in a race as to which should be the first to enter Chicago. The Illinois Central signed an agreement with the Michigan Central, allowing it to use the Illinois right of way between Calumet and the city; and construction was then rapidly pushed from Calumet, now Kensington. But at Grand Crossing a serious hitch occurred. Here it must cross the rival right of way of the Southern Michigan road, and the latter demanded that the crossing should be by means of an overhead bridge, and not on grade level. Such provision was wise, in view of later railroading, but to this struggling new road it was an almost insurmountable handicap. The question hung fire for some weeks, neither side giving in, until Colonel Mason took time by the forelock and ordered a gang of workmen to the disputed point under cover of night. A guard on duty at the Southern track was seized, and before sun-up the new tracks were put down right across the others. Possession being nine points of the law, the matter was dropped.

Construction was now rapidly pushed, and, on May 21, 1852, a work-train, combined with a passenger and freight belonging to the Michigan Central, entered the lake metropolis. By October of the same year contracts for grading the entire line had been awarded. Fifty locomotives were also ordered—a very large contract for those days—from the works of Rogers, Ketchum and Grosvenor, at Paterson, New Jersey; as well as four second-hand engines for immediate use. The rails, amounting in the aggregate to 72,000 tons—another tremendous item—were purchased in England, that country still having almost a monopoly on skilled iron work. It is said that one vessel bringing 750 tons of iron in its hold encountered storms and foundered. Its crew was rescued in mid-ocean after great peril, by a passing liner.

The whole project was, in fact, a tremendous undertaking. In these days of built-up communities and labor-saving devices, we have but a faint conception of the problems daily confronting those prairie engineers. So sparsely settled and wild was the country that there were not, at this time, a dozen places on the entire line big enough to find a place on a map. The road had to build its own construction camps and house and feed its men; not only that, it had to import most of them from "back East." From six to ten thousand laborers were required, and as there were other railroad works going on in the Middle West at this same time, the difficulty of getting and keeping men was keen. Regular recruiting agencies had to be maintained in several Eastern cities, as in time of war. It was "one of our greatest problems," said Colonel Mason, "that of procuring sufficient and satisfactory labor. . . . In most cases transportation was paid to Illinois with the promise of reimbursement from their wages; but these promises were frequently disregarded, and many men, after reaching Illinois, would not go on the work, but would seek employment elsewhere to avoid paying their transportation.

"The prevalence of cholera," he continues, "and 'milk-sickness' also seriously interfered with our progress. During the summers of 1853 and 1854 cholera epidemics broke out in many of the towns and construction camps, so that it was sometimes necessary to abandon work entirely, for men who were not stricken scattered like frightened sheep. Men at work one day were in their graves the next. In Peru, adjoining La Salle, 130 died in ten days. The prevalence of 'milk-sickness,' fever and ague, and the fact that it was dangerous during the summer months to eat either beef or butter, or drink milk, frightened the men and added to our troubles. And then, too, our difficulties were increased vastly by the presence of numerous groggeries and the sale of whiskey to the construction forces. Drunken frolics and riots were not uncommon occurrences. One of the most serious riots occurred in December, 1853, among the laborers on the heavy bridge construction at La Salle, resulting in the murder of a contractor named Story, and another man, and the wounding of several. The State troops were called out to maintain order. Another serious riot occurred near Cairo, in consequence of a drunken fight in which a citizen was killed. One hundred and fifty laborers left in a body after the riot. Notwithstanding every effort to drive out those who purveyed whiskey to the men, they continued to menace the work, and every new construction camp that was established was followed by the location of one or more of these disreputable groggeries."

Despite all these difficulties, the road was finished within the time limit, the last spike being driven in the main line, on December 28, 1854.

In the files of the Illinois Central some interesting correspondence and bulletins are still preserved, relating to the early operation of its trains.

In November, 1856, a report states that "the engineers on the Chicago branch have been in continual hot water with us. Only a night or two ago two engines lay over at Kankakee for 24 hours while the engineers and firemen were off on a drunken spree." Another states, in June, 1856, that "Mr. Clark has fitted up one engine for burning coal and is meeting with success. I understand this is the only engine on the line burning coal at present. Mr. Dove says he will proceed to fix up others as fast as he can." The same report mentions that "on Saturday the northbound freight train, five miles north of Chebanse, encountered a drove of cattle, throwing engine 74 down the bank and nine cars with it. One bullock was killed and others were injured."

About the same period it was stated that "engine 72 went out on the trestle east of the roundhouse at Chicago and sank into the Lake. It now lies like a stranded ship with the waves breaking over it. Such is the character of the bottom, so unstable and shifting."

A few weeks later the same official reported that he had written the Postmaster General that "trains between Mendota and Dunleith have been at a standstill for ten days, on account of ice and snow. The twelve snowplows owned by the company have been of little use. Several engines are off the track."

Two days later he reported that "the —— Railway are stealing Illinois Central cars. Three of our cars have been repainted, 'I. C.' scratched off and —— painted on them. It is evident that we will have to go into an open war with that company."

A story is told of the difficulties experienced at Galena, where the townspeople objected to the extension of the road to Dunleith, now East Dubuque. All sorts of objections were placed in the way of the builders, and a temporary track, insecure, with several sharp curves was constructed. The track was so dangerous that the official in charge had to pay a premium to the first engineer who undertook to run an engine over it. "I will give you $100 if you get through safely," said the official. "How much will you give my widow if I don't," countered the engineer. "I will give her a thousand," was the reply. "Done," said the engineer. The engine was piloted safely, and the hundred dollars paid.

Mention has already been made of Abraham Lincoln's connection with the Illinois Central. Colonel Anderson, in a series of articles running in the road's magazine, a few years ago, says: "The Hon. James F. Joy, the leading railroad lawyer at that time, became in 1852 the chief counsel for the Illinois Central Railroad Company, when . . . he retained Abraham Lincoln as local attorney at Springfield, to which, by Lincoln's influence, the state capital had been moved from Vandalia. As the local attorney for the road under these formative conditions, Lincoln had plenty to do."

An article by another writer, Mr. Drennan, in the same magazine, later says that Lincoln "continued to serve the Illinois Central as one of its lawyers until his election to the Presidency. Records still in existence disclose that he was consulted frequently and that his opinions were highly respected." Mr. Drennan informs me that the length of the railroad at this time was between 700 and 800 miles. The engines, cars, and equipment were of the old type used in that day upon all the railroads. The road-bed was of the same inferior grade.

A further interesting fact is that one of the officials of the road at this time was George B. McClellan, the later famous general of the Civil War, and that Lincoln first made the acquaintance of "Little Mac" through the business of the railroad.

During the Civil War the Illinois Central formed an important artery of travel and an important factor in moving men and supplies to the front. The division extending from Centralia to Cairo, over a hundred miles in length, was "a thoroughfare for the armies going South, and funeral trains coming North." The charges for transportation for this service brought up a question which President Lincoln had to use his good offices to settle. According to the terms of the original land grant, under which the road was built, all supplies and troops of the United States were to be carried over the road without charge. As this was found to have reference only to certain sections of the road, Lincoln in a letter to the Secretary of War, which is still in evidence, advocated an adjustment of the railroad claims, and this was later effected.

From the year 1860 to the present time, the Illinois Central holds the enviable record of having met all its fixed charges without exception, and paid all its dividends without default. It now has a total trackage of about 9,000 miles, operating not only in its own state, but owning or controlling various lines as far south as Mississippi, Alabama and Georgia.

XIV

SOME MID-WESTERN LINES

The Louisville and Nashville Railroad

In preceding chapters we have dealt with two small pioneer roads of the Middle West and South—the Lexington and Ohio in Kentucky, and the Pontchartrain in Louisiana. These were later absorbed in the system known to-day as the Louisville and Nashville—though nobody troubles to say anything more than the initials. The "Ellen N." is quite as famous in her own states, as the "Katy" is in hers.

It was the turn of the middle of the last century before the Louisville and Nashville road got under way. The legislature of Kentucky granted a charter to a company to construct and operate a line between the two mentioned cities, a distance of 185 miles, and the legislature of Tennessee agreed to it. Accordingly subscription books were opened, and by September 4, 1851, a total of 1058 shares were taken. However, the first payments amounted to only $58, and from this an advertising expenditure of $22.55 had to be deducted, leaving a balance in the treasury of $35.45, with which to commence operations!

The authorized capitalization was three million dollars, of which the city of Louisville subscribed one-third. Later on, when the original stock was bought back, the shareholders received over four dollars for every dollar put in.

The project is spoken of as a bold undertaking, by virtue of the fact that while Louisville was then almost exclusively a river town, the country lying between it and Nashville was sparsely settled, with great natural barriers to be overcome. And Nashville, at that time, had only ten thousand inhabitants.

The promoters, however, were not disheartened; they looked far to the future, and must have visualized the prosperous country of that later day. As soon as they had enough ready money to start, they started. Dirt was broken in April, 1853, and grading and track-laying proceeded apace. As soon as construction had reached the first town on the route, regular train service was established, and this was extended as fast as the road work warranted.

November 1, 1859, was a red-letter day in the history of the railroad, for on that day the first through train arrived in the southern terminus. Great was the rejoicing in the Tennessee capital, as the little engine with its huge bell-shaped smokestack, so familiar in the fifties and sixties, puffed its way into the station, with flags flying from its pilot and bunting on its cars. Little did the citizens dream that within a few short months that same railroad would be employed in hauling blue-clad soldiers from the North to do battle in the South. But that again is another story.

To illustrate the public spirit of the people along the route, the story is told that when Marion County, Kentucky, had voted in favor of financial assistance to the new road, a clause was inserted to the effect that cars should be in operation to Lebanon before October 31, 1857. But an engineering problem at Hardin's Creek delayed matters considerably. The citizens, becoming exasperated at the slow-moving contractors, took matters into their own hands. They filled in a hollow, laid a temporary set of rails, and, one day ahead of the time limit, a train rumbled into the town.

This story was told by Captain Alfred Pirtle, a veteran conductor of the L. and N. who entered the service of the company in 1857. In March, 1925, when the first number of the employes' magazine of this road was issued, Captain Pirtle was still living, a man of remarkable mentality at the age of eighty-eight. Thus within the span of one man's life has been compressed the entire history of this great system which serves the Middle West and South.

Captain Pirtle further says that when he began to run on the road the entire equipment consisted of four engines, five passenger cars, two baggage cars, and about three dozen box cars. A five-foot gauge was first employed.

One of the many later acquisitions of the L. and N. was the Memphis and Ohio, leased in 1867 and purchased four years later. A book of train rules issued by the latter road, and still in existence, shows the ludicrous side of train operation sixty or seventy years ago.

One of the chief instructions addressed to the station agents was that while the "usual load of a freight car is eight tons, they will in no case suffer more than nine tons to be loaded into any one car." To-day they load seven or eight times that amount in a single car.

The section foremen were directed to "devote particular attention to the condition and health of negroes under their charge, and deal with them in a firm, resolute and temperate manner. Chastisement, if required, must be administered in moderation, and within the bounds of the law, which is not to exceed 39 lashes—negroes will never be struck with the fist, or a stick, club or other heavy instrument. Should a negro run away, notice of the fact must be immediately given to both the Road Master and Clerk of Repairs and Assistant Superintendent, stating the name of the negro, date and cause of his running away, together with all attending circumstances."

One of the instructions directed to the passenger conductors was that they should "see that their cars are kept neat and clean in every part, having been carefully swept and dusted every trip. Nothing is more offensive to passengers than to be seated in a dirty car. . . . They will see that there is an ample supply of drinking water on the train for all the passengers and that it is *frequently* passed around among them so that all may be supplied. In very warm weather, water will be carried through the train between every station unless the car is supplied with water."

Freight conductors were instructed to "station their train hands at their respective posts on the train, and in such a manner so as to discover fire upon the train should it occur. . . . If at any time during the trip the smokestack or chimney of their engine gets out of order, so as to endanger the safety of their train, or cotton that the engine may have to pass, the conductor must put the train on the first side track and return engine to Memphis."

For their part, the enginemen were directed to "be particular to see that their chimney is kept in order so as not to throw fire. When passing cotton, either at depot, flag station, or upon cars upon a turn-out or main track, the *damper must be kept closed* and the engine controlled *with a light exhaust*."

A general train rule specified that "trains meeting between stations, the one nearest the side track will run back. In case of meeting, or near the center, the lightest loaded engine (of which the conductors of both trains are to determine) will run back, being followed by the other train." We can but wonder at the outcome when two belligerent conductors started to thresh out the matter as to which had the lighter train.

To-day the Louisville and Nashville Railroad enters thirteen states with a total length of over 5,000 miles. It is one of the most important arteries of the Middle West.

The Michigan Central Railroad

The Michigan Central Railroad dates back to the year 1833, and a time when the state from which it takes its name was still a territory. The whole section did not contain more than 35,000 inhabitants, and large tracts were still virgin forest and swampland, the paradise of wild game. Fur-traders were active, as they had been since the time of the French, two hundred years before.

But in the year 1833, the first definite move was made toward penetrating the wilderness and opening it up, when a charter was granted to the Detroit and St. Joseph Railroad, to run across the Territory from the Straits of Detroit to Lake Michigan.

For want of financial support, however, the project did not get very far—which is hardly to be wondered at, considering the primitive condition of the country,—and three years later when Michigan was admitted to statehood, the new commonwealth took over the property with the avowed intention of building the road, which was thereafter to be known as the Michigan Central. Public ownership, however, did not make any better progress than private, and in 1845 the road reverted into the hands of another group of promoters.

An Eastern engineer, John W. Brooks, who had been superintendent of the Auburn and Rochester Railroad, was called in and made a thorough inspection of the property. While he found it in bad shape, he saw possibilities of a profitable rejuvenation. Brooks interested a Boston banker, John M. Forbes, in the road, and a small syndicate was formed, which purchased it for two million dollars, three million less than it had cost the state.

The property accruing to the new owners was in a most deplorable condition. The poor construction of the track was similar to other early American roads, and we are told that the ties which supported the wooden stringers, on which the iron straps were fastened, were in turn laid on under sills, which rested on still other blocks.

The track leading out from Detroit for a distance of 30 miles, being the oldest constructed and never having been renewed, was found to be considerably decayed. The iron straps, called snake-heads, were compared to "a barrel-hoop tacked to a lath," and were so curved up at the ends that an official's wife was said to have been killed by one of them entering the floor of a car.

Daniel Webster was brought all the way from his home in Massachusetts to write the new charter.

How the new corporation secured an entrance into Chicago has been told elsewhere. After many vicissitudes the road finally became the great route it is to-day, with a total mileage of two thousand miles, and operated as a separate unit of the New York Central lines.

The Wabash Railway

The present Wabash Railway system had its inception in a pioneer road known as the Northern

Cross Railroad. It was one of the first incorporated in the fledgling state of Illinois, and was fathered by the profligate legislature of 1837, which squandered the state's future wealth riotously, and of which legislature Abraham Lincoln was a member. The Northern Cross was among the favorites in this session, and of the twelve millions of dollars appropriated for internal improvements, a million and three-quarters was appropriated to it. In fact, it was the only road constructed under the legislative act.

The road was to begin at Quincy on the Mississippi River and passing eastward through Jacksonville, Springfield and Decatur, extend to the Indiana state line.

Under the provisions of the law a Board of Commissioners was appointed and Murray McConnel, a progressive attorney, was the Commissioner having in charge the public improvements of the First Judicial District. A chief engineer and assistant were put in control of the actual work. Commencing at Meredosia, on the Illinois River, a survey of the projected road was quickly made through Jacksonville to Springfield, to consist of two divisions, with Jacksonville as the dividing line, and junction. On July 10 contracts to grade, construct and complete the two sections were signed, the work to be completed by January 1, 1840.

Meanwhile the aggressive McConnel had placed orders for all equipment thought necessary, but the one locomotive was reported "lost in transit" and another had to be substituted.

The contract price for the road construction was $8,430 a mile, mud-sills and cross-ties forming the foundation on which the longitudinal stringers with their flat strap-iron rails rested. The size of these rails were two and one half by five-eighths inches, and the weight was thirteen pounds to the yard. Quite a contrast to our steel rails of to-day! The rails were spiked to the stringers with twenty-penny nails.

On May 8, 1838, just one year after the surveys commenced, the first rail was laid, and on November 8 of that year the locomotive purchased to replace the lost one was unloaded from a packet steamer at Meredosia and placed on the Northern Cross tracks. This engine, called the "Rogers," was built by the Rogers, Grosvenor and Ketchum works of Paterson, New Jersey. The trial trip to Morgan City, twelve miles away, was made in two hours, to the amazement of the hundreds of spectators who had assembled to witness a real train in operation. It is of special historical significance that this little engine was the first to operate in the entire Mississippi Valley.

By the beginning of 1840 the first division, from Meredosia to Jacksonville, a distance of twenty-four miles, was in operation. Meanwhile, the large sum of three million dollars had been expended on the second division, but work had been suspended with the road unfinished. Nothing daunted, the legislature authorized the governor to expend a hundred thousand dollars more, to complete the line from Jacksonville to Springfield, the new capital of the State. This was done, and the line opened to traffic in the spring of 1842. Due to the hectic conditions of the state's finances, nothing further was done for five years, when the road was conveyed to a party of private promoters, doing business as the Sangamon and Morgan Railroad Company.

During the entire period of state operation, but two engines were in service, the one mentioned, and another built by M. W. Baldwin of Philadelphia, the founder of the present Baldwin works. When the new owners took possession they found the motive power in such a condition that it was unfit for use. And we are told that for several months, or until new engines could be secured, the trains, consisting of two cars, were drawn by oxen and mules. And this in the year of our Lord 1847!

Eight years later the Sangamon and Morgan became the Great Western Railroad, and by the latter part of 1856 the road was completed to the Indiana state line where a connection was formed with the Lake Erie, Wabash and St. Louis road, chartered by the state of Indiana. This latter ran from the eastern to the western state line through Indiana and now forms the main line of the Wabash.

In 1857, Thomas Mather of Springfield, one of the owners of the Great Western, went to New York and sold the road to Robert Schuyler for a hundred thousand dollars, Schuyler being considered at that time one of the great railroad magnates of the country.

Through various sales and consolidations has resulted the present Wabash Railway with its 2,500 miles, its important terminals in many of the large cities of the Mid-west as far as the Mississippi River, and its 20,000 employees.

The present management has sent the writer a copy of the "Rules for Running the Trains" of the Great Western Railroad in use about 1860, which is most interesting as depicting the regulations prescribed in train operation at that period of its history. We append some of these rules.

> "The dampers of the ash pan must be closed when crossing all bridges, and all bridges must be crossed at a speed not exceeding 6 miles an hour. *The speed through towns must not exceed six miles an hour*, and through Springfield and Decatur, *five miles per hour*.
>
> "The clock in the Depot, at Springfield, will be taken as the standard time. Conductors and Engineers will compare their watches daily.
>
> "If any part of the train becomes detached when in motion, care must be taken to keep the leading part out of the way of the detached part, and it is the duty of the brakeman to stop the detached part to prevent a collision with the part in advance.
>
> "Throwing wood from the Tenders of Engines, while the same are in motion, *is strictly forbidden.* Wood that cannot be used in the *furnace*, must be unloaded at the stations where the engine is supplied with fuel and water.
>
> "Baggage and brakemen will not pass through the passenger cars when they are in motion, but

remain at their brakes, attentive to their duties. Smoking, reading or conversing while on their trains is strictly forbidden. Baggage Masters will act as Brakemen at all times.

"Trains will not be allowed to obstruct streets, except when in motion.

"Great care must be taken to avoid running over Stock, and too frequent occurrences of this kind will be considered as evidence of incompetency on the part of Enginemen and Conductors, who are the responsible persons in charge of the Trains. Engineers are required to report to the Conductor or person in charge of the train, at the end of each trip, all accidents or injuries to Cattle, Horses or domestic Stock, giving the locality, and facts connected with the accident, so that a correct record may be kept in the office of the Superintendent.

"Construction and Repairing Trains must in all cases keep out of the way of Passenger Trains, and NEVER be on the track on their time. Construction and Repairing Trains after waiting thirty minutes for Freight Trains, between sunrise and sunset, when the weather is clear, and on those portions of the road where the lines are straight, and road in view for at least two miles, may proceed with caution on the time of Freight Trains. Freight Trains, when more than thirty minutes behind time, must proceed with caution, keeping a lookout for construction and repairing trains. On the approach of Passenger or Freight Trains, Construction or Repairing Trains will give way at once.

"Such employes as feel that they cannot conform to these rules, are requested to tender their resignation."

The Rock Island Railroad

The Rock Island Railroad has the enviable distinction of being the first road to cross the Mississippi, thus linking up the East and the West by direct rail connection. In doing so, a bridge was thrown across the Father of Waters, which brought about a celebrated lawsuit, in which the railroad attorney, Abraham Lincoln, established a famous precedent. But this is getting ahead of our story.

The early history of this road does not differ from many another as to details of construction, except in the important essential that it must cross the Mississippi. The idea originated in the minds of enthusiastic citizens of Rock Island, Illinois, and Davenport, Iowa, about the year 1845. Two years later a company was actually organized, known as the Rock Island and LaSalle Railroad Company, but nothing definite was done on account of lack of capital. The company was reorganized in December, 1851, and the original charter was amended permitting the road to enter Chicago.

Construction then proceeded rapidly, and the first passenger train left Chicago on October 10, 1852, bound for Joliet, which was as far as the track had been laid. The first depot in Chicago, in which no little pride was taken, was a plain, wooden, whitewashed structure, sixty feet long and illuminated by kerosene or "coal oil" lamps. It was at Twenty-Second Street.

Meanwhile, over in Davenport the plan for tying up the railway line in Iowa with that of the sister state, by a bridge, was being systematically boosted. A big public dinner was held and subscriptions actively taken. The citizens of Iowa felt that it was high time they were taken in out of the cold, so far as direct railroad connections with the East were concerned. As one of the promoters, Antoine Le Claire, said, referring to the fact that his State now had a population of over 200,000, "We of Iowa have already granted right-of-way to more railroads than can be built in a hundred years, they being mostly like the Philadelphia, Fort Wayne and Platte Valley Air Line Railroad, which has so exhausted the corporation to write the whole name, that no energy or breath is left to build the road."

As a result of this agitation the Iowa legislature granted a charter to the Mississippi and Missouri Railroad Company to run from Davenport westerly to Council Bluffs; while the Illinois assembly authorized another concern, the Railroad Bridge Company, to "construct, maintain and operate a bridge" across the Mississippi "in such manner as to leave unobstructed the navigation of the waterway." Observe carefully the wording of this resolution, as upon it hinged the famous lawsuit.

While the bridge was being built, the railroad across the state from Chicago to Rock Island was completed, and on June 5, 1854, a gala excursion was run to celebrate the event. A distinguished party was present, among whom were Ex-President Fillmore, the journalist Dana, the historian Bancroft, and others of note. Five steamers awaited them at the river brink and a voyage up the river as far as St. Paul was made.

Rock Island was chosen as the best point to throw a bridge across the river, as there was a small island of this name out in the channel, which avoided the necessity of a long span from shore to shore. As the Rock Island Company itself has explained: "The construction really involved three portions—a bridge across the narrow arm of the river between the Illinois shore and the island; a line of tracks across Rock Island; and a long bridge between the island and the Iowa shore. The channel of the river passed very close to the west side of the island, and down the middle of this channel ran the boundary line between the two states."

As the bridge contractors began their work of sinking piers and erecting superstructures, every move they made was watched with jealous eyes by the river-men. The latter felt that their own peculiar and sacred domain was being invaded. The river belonged to them, and the safety of their boats was menaced by these piers. Back of this was another and still more disturbing thought. The coming of the railroads would take away their freight monopoly; and the steamboats at this time were doing a tremendous business. So the powerful river interests watched their chance to scotch this potential rival.

It was not long in coming. Although some legal difficulties had been thrown in the way of the contractors, the bridge was completed and triumphantly opened, on April 21, 1856, when a locomotive, called the "Des Moines," crossed to the Iowa side—for the first time in history. Within a few days regular service was established, amid much jubilation. But disaster was lurking just around the corner. On May 6, a packet boat, the *Effie Afton*, struck one of the piers and burned, and in so doing destroyed a part of the bridge itself. Feeling ran high, it being charged that the so-called accident was in reality part of a plot on the part of the river-men.

The lawsuit that followed attracted wide attention. It was in reality a test of strength between the railroads and the river traffic. The best legal talent was employed, and on the side of the bridge company appeared Abraham Lincoln, then recognized as one of the ablest railroad attorneys of Illinois. I have dealt with his handling of this case at considerable length in my book, "Lincoln and the Railroads," and will therefore not go over the ground again here, except to say that he rested his argument on the principle that "one man had as good a right to cross a river, as another had to sail up or down it; that these were equal and mutual rights which must be exercised so as not to interfere with each other."

The trial lasted for several days, and the jury got so flooded with eloquence that it ended by disagreeing. The case dragged along until in May, 1858, when an Iowa Judge declared the bridge "a common and public nuisance" and ordered the three piers and their superstructure which lay within the state of Iowa removed. The decision was appealed to the United States Supreme Court, which reversed this ruling, and settled the controversy for all time. The bridge stayed.

One of Lincoln's arguments in contrasting the advantages of railroads over inland waterways is cogent. "This particular railroad line," said Lincoln, "has a great importance and the statement of its business during a little less than a year shows this importance. It is in evidence that from September 8, 1856, to August 8, 1857, 12,586 freight cars and 74,179 passengers passed over this bridge. Navigation was closed four days short of four months last year, and during this time while the river was of no use this road and bridge were valuable. There is, too, a considerable portion of time when floating or thin ice makes the river useless, while the bridge is as useful as ever. This shows that this bridge must be treated with respect in this court, and is not to be kicked about with contempt. . . . The proper mode for all parties in this affair is to 'live and let live.' "

Since the road over in Iowa is now a part of the Rock Island system, and it was the pioneer road of the state, an account of its building is of interest. The Mississippi and Missouri Railroad was incorporated in February 1853. In September the first spadeful of earth was turned by the versatile Le Claire for the first railroad in Iowa. Peter A. Dey, a famed railroad engineer of his day, was Chief Engineer, and his assistant was Grenville M. Dodge, formerly of the Illinois Central. One of his assignments was the location of a feasible route beyond the Missouri for a railroad to the Pacific, so that the Iowa road might have a proper connection.

On June 29, 1855, the first rail, imported from England, was laid, and ten days later the first locomotive to operate in Iowa was unloaded from a steamboat crossing the Mississippi. It had been aptly named the "Le Claire."

Four months later the state witnessed the unprecedented sight of a train operating within its borders, as far as Muscatine, a distance of 27 miles! A contemporary journal of the latter place in describing the event, speaks of it modestly as "one of the most sublime triumphs of mind over matter that perhaps the history of the world records."

The plan was to reach Iowa City before January 1, 1856, but nine o'clock of the night before saw the track completed to within a thousand feet of the station. The thermometer, we are told, registered 30 below zero, and prominent citizens toiled side by side with the laborers in an effort to accomplish the desired result. All along the route the scene was lighted by bonfires for the toilers, and as each section of track was laid the engine moved forward apace. By eleven o'clock they were within two hundred feet of their goal when the engine froze up. Some of the workers then had to divert their energies to pushing the engine with pinch-bars. Just as the local church bells tolled the coming of the New

Year the depot was reached, and the engineer, suffering from exposure and reaction, was overcome and had to be carried into the depot.

That, gentle reader, was only a trifle over seventy years ago—when they were willing to freeze the marrow of their bones to put a railroad into Iowa. Today the Rock Island system alone operates 8,000 miles of track in the West and Southwest.

The Chicago, Burlington and Quincy Railroad

Another great railway system of the West which threw its rails across the Mississippi is familiarly known as the "Burlington Road," partly from the fact that it is at this Iowa town it makes its entrance into the West.

Scanning its origin, we find that, in 1849, no less than three roads were chartered by the Illinois legislature, which are now a part of the Burlington system. The first was called the Aurora Branch; the second, the Peoria and Oquawka; and the third, the Central Military Tract. All were short connecting links with other roads, and on the Aurora line second-hand equipment was used. In 1852 this road was changed in name to the Chicago and Aurora. Two years later the Central Military Tract road was completed; but the Peoria line, due to financial difficulties, was not completed until 1857. The merging of these three lines with others brought into existence the present Chicago, Burlington and Quincy Railroad, which was incorporated as such in March, 1855.

It is further stated that while the Burlington Road has received public land grants from three states, Iowa, Missouri, and Nebraska, it has received none from its parent state, Illinois.

One of the first locomotives used on this road was the "Pioneer," which was leased from the old Chicago and Galena Union road, now a part of the Chicago and Northwestern system. It had been originally built for the Utica and Schenectady road, by the Baldwin company, and was the 37th turned out from their shops. When sent west, in 1848, it was the first locomotive to enter Chicago.

The Burlington Railroad of to-day represents the consolidation of two hundred separate companies, and is the largest carrier of livestock in the world.

The Chicago and Northwestern Railway

The Chicago and Northwestern Railway system, which to-day consists of over 10,000 miles of main-line trackage, representing a property investment of six hundred million dollars, and traversing nine states of the Mississippi Valley, had its origin in the Galena and Chicago Union Railway, the first railroad to build west from Chicago.

In 1847 the first contract for construction work was let, for a piece of road seven miles long between the Chicago River and Kinzie Street, and the following year an additional thirty-one miles was put under contract. On October 24 of that year the first locomotive, called the "Pioneer," to run westward from Chicago made its initial trip, and the present management of the Chicago and Northwestern say that "its installation marked an epoch in the history of Chicago." As there were no rail connections between the city of Chicago and points east, the "Pioneer," weighing ten tons, was brought by rail to Michigan City, shipped across Lake Michigan by boat, and hauled to the tracks by teams.

By 1855 the Mississippi River was reached, when Fulton, Illinois, was entered by the Galena and Chicago Union, and in 1867 the line between Clinton and Council Bluffs, Iowa, was completed. Therefore, when the Union and Central Pacific roads met in 1869, the Chicago and Northwestern formed a link of the first transcontinental railroad system.

It was in 1864 that the present name of the corporation came into being by the consolidation of the lines between Chicago and Appleton, and the Galena and Chicago Union. By a steady progression it has expanded and now in addition to its own lines controls the Chicago, St. Paul, Minneapolis and Omaha Railway.

"The first railroads of the Northwest," says the management in a statement to the writer, "seemed to have planned to coördinate their transportation with water transportation at the time on Lake Michigan and the Mississippi River, and the lines of the Chicago and Northwestern Railway particularly are so located as not to come into direct competition with local water routes, but in every way to supplement them and open up new territory and coördinate the rail with the water transportation of the time. . . .

The Chicago and Northwestern Railway is particularly a granger road, and its fortunes are wrapped up with the prosperity of agricultural communities which are served by it."

Mr. Balch, the statistician of the road, has furnished me with a list of the "firsts" which his road claims credit for, and they are interesting.

> "The Chicago and Northwestern Railway," he says, "was the first western railway to direct its operations by telegraph. The line between Freeport and Chicago was controlled by telegraph communication in 1854.
>
> "It was the first railway to build a railway postal car for use in carrying United States mail. In 1864, upon its own initiative, it built the first railway postal car and thus initiated the service which is now nation wide.
>
> "It was the first line to complete a double track between Chicago and Omaha, thus making connection with the Union Pacific, and these two lines now constitute the longest stretch of double track railways west of Chicago, and this arrangement completes a line of double track railway over which a person may travel from New York City to Ogden, Utah, and, in fact, with the exception of a few comparatively short stretches, this same double track system extends to San Francisco, California, and constitutes one of the marvels of America's railway transportation system.
>
> "The Chicago and Northwestern was operating the first dining service between Chicago and San Francisco, in 1869.

"It was also the first line west of Chicago to operate sleeping cars. In 1863 it was assigned one of the first two palace cars which were built by George M. Pullman. In addition, it was the first western railway to inaugurate an all-Pullman car train service."

The Missouri Pacific Railroad

In 1926 the Missouri Pacific Railroad, a corporation having a total length of over 7000 miles, fittingly celebrated its Diamond Jubilee with an eight-night display of "Service—A Pageant of Progress" in the stadium of Washington University in St. Louis and a banquet at the Chase Hotel, in which high ranking railroad officials participated. And we can but wonder what Thomas Allen, the first president of the road, must have thought, could he but have been in attendance.

While as early as 1836 Missouri held a state railroad convention in St. Louis, nothing outside of an agitation was accomplished until shortly after the discovery of gold in California in 1848. The beginning of the next year witnessed a renewal of interest, and in many quarters it was considered but logical that St. Louis should be the starting point of a transcontinental railroad.

On March 18, 1849, a charter was granted to the Pacific Railroad to build and operate a road from St. Louis to Jefferson City and thence to some point on the western boundary of the state, and in October a large convention of enthusiasts was held in St. Louis to further the project, twelve states sending delegates.

Early in 1850 at a public meeting in St. Louis President Allen appealed for funds. "The most important consideration is the means," he said. "The road is going to cost a great deal of money. Why should not St. Louis exhibit the public spirit of other cities?" One of the moneyed men present, James H. Lucas, offered to be one of three subscribers to make up a hundred thousand dollars. Two other promoters promptly took him up and then by a toss of a coin determined which one should have the privilege of subscribing the odd thousand.

On July 5, 1851, the ground was officially broken for the project, Mayor Kennett turning the spadeful of earth. It was a gala day for St. Louis. President Allen ventured the hope that "the spades put into the work to-day, here upon the bank of the Mississippi, may not grow rusty until they have been finally burnished in the gradation of the last division of our road through the golden sands of the Pacific."

The following year the "first train west of the Mississippi River made a trip over the first few miles of completed railroad." Construction was pushed as rapidly as possible, and in 1853 the first division was in operation. At about the same time the route of the St. Louis and Iron Mountain, now a part of the Missouri Pacific system, was located, and Jefferson Davis, then Secretary of War, sent a communication to the promoters of the former road, in which it was ordered that the trains passing through Jefferson Barracks should be pulled by horse-power on account of the arsenal and magazines there. However, this order was never executed.

Progressing west, construction was halted temporarily at Sedalia, in 1861, by the outbreak of the Civil War. During the "unpleasantness" much of the railroad property and equipment were destroyed and made away with. With all this, however, the road reached Kansas City in 1865, and on September 20 the first train entered the city.

In 1872 the Pacific road was leased to the Atlantic and Pacific corporation, but due to financial complications arising, the lease was cancelled and a new company, known as the Missouri Pacific, assumed control.

In 1879 Jay Gould bought a controlling interest in the road for $3,000,000, and used it as one of the units in his network of roads operated as the Southwest System. The panic of 1884 put an end to this scheme of things, and in the smash-up the Missouri Pacific and the Iron Mountain by mutual agreement combined interests, and to-day with acquisitions the Missouri Pacific Railroad Company is one of the leading lines of the great Southwest.

XV

THE FIRST TRANSCONTINENTAL SYSTEM

"Westward the course of empire takes its way." No sooner was the young Republic getting on its feet than her far-sighted citizens looked to the west for new worlds to conquer.

General Clinton, during the first administration of Washington, sponsored a petition in Congress for the construction of a great roadway from the Hudson River to Lake Erie. This was to be called the "Appian Way," the object being to develop the resources of New York which lay west of the Hudson.

In 1823 John Stevens, at a time when there was nowhere in the entire world a steam railroad utilized for freight or passenger transportation, advocated such a system for the then United States, extending to Pittsburgh from New York by way of Philadelphia "and thence into the heart of the extensive and fertile state of Ohio, and also to the great western lakes."

Three years later, Edwin F. Johnson, an early noted civil engineer, at the age of twenty-three, suggested a railroad from the Hudson to the Mississippi, and five years afterward published a pamphlet dealing with the subject which had much to do with shaping public opinion in favor of the New York and

Erie Railroad project. Meanwhile, in 1829, William C. Redfield had agitated in favor of a "great railway between the Atlantic States and the great valleys of the Mississippi" from a point "on the Hudson River in the vicinity of New York" to a point on the Mississippi River just above the Rock Island Rapids in Illinois.

With the advent of the thirties a regular orgy of transcontinental projection was launched. Probably the first advocate of a railroad to the Pacific coast was the editor of a newspaper published at Ann Arbor, Michigan, who in the February 6, 1832, issue of his *Weekly Emigrant*, advocated the construction of a line from the Great Lakes to the Pacific Ocean. And this when less then a hundred miles of road had been built in the East.

Two years later, a Massachusetts physician by the name of Samuel B. Barlow advocated the *early* construction of a transcontinental road, in various papers, even going so far as to place an estimate on the cost and time of construction. The general route proposed was from the city of New York to the mouth of the Columbia River, the United States government to father the project.

In 1836, John Plumbe, then residing in Dubuque, Iowa, but previously connected with the southern road running between Richmond and Petersburg, held a meeting in his home for the purpose of discussing a contemplated line of rail to the Pacific coast, which General Dodge has said was "the first public meeting to consider the project of a Pacific railway." And two years later in furtherance of Plumbe's plan there was held what has been termed "the first public convention to discuss" such a project, one result being that a resolution forwarded to Congress was favorably acted upon by the legislators, who passed an appropriation for surveying a contemplated line between Milwaukee and Dubuque.

However, in connection with Plumbe's project, the writer has seen in an autobiographical sketch of General Albert Pike that he himself was the first to propose a Pacific railroad convention, and as a result the Arkansas legislature sent out invitations to various of the southern states. This convention was held at Memphis, and the following year a second was held at the same place. This was followed by other meetings at Charleston, New Orleans and Savannah. Following the Charleston gathering Pike addressed the Louisiana legislature at Baton Rouge and obtained the passage of a charter for a Pacific railroad with termini on the Pacific coast at San Francisco and Guaymas. Pike gives no dates for these various conventions, but he was a thoroughly reliable man of versatile attainments.

Probably the first exponent of a transcontinental railroad who had traversed the country to the westward himself, was Samuel Parker, a Presbyterian missionary, who noted in a journal of his travels, published in 1838, that "there would be no difficulty in the way of constructing a railroad from the Atlantic to the Pacific Ocean"; and in the June issue of the *Knickerbocker Magazine* for that year a reviewer emphatically stated "the work will yet be accomplished! Let the prediction be marked. This great chain of communication will yet be made, with links of iron. . . . The reader is now living who will make a railroad trip across this vast continent."

Thus when the early forties dawned and Asa Whitney appeared on the scene, a somewhat respectful hearing was accorded him by those progressive spirits who had probably heard the dire prediction made by Senator Dickerson of New Jersey in 1825 that the territory of Oregon would never become a state of the Union. His reasoning was certainly plausible.

> "The distance a member of Congress of this state of Oregon would be obliged to travel in coming to the seat of government and returning home would be 9,300 miles. If he should travel 30 miles a day it would require 306 days. Allow for Sundays 44, it would amount to 350 days. This would allow the member a fortnight to rest himself in Washington before he should commence his journey home. This traveling would be exceedingly hard, as a greater portion of the way is exceedingly bad, and a portion of it over rugged mountains, where Lewis and Clarke found several feet of snow in the latter part of June. A young and able-bodied Senator might travel from Oregon and back once a year, but he could do nothing else."

In 1845 Whitney took up his cudgels very vigorously in favor of a transcontinental railroad, and toured the then known United States from the eastern seaboard to the Mississippi, importuning state legislatures, boards of trade, and other bodies, and broadcasting his ideas of a system from Lake Michigan to Oregon. His plan was to get public sentiment so aroused in the project that Congress would be influenced to the extent of allowing him a grant of land sixty miles wide for the whole route to be traversed. In 1848 a bill was introduced in fact, in both Houses. But the country was not yet ready for such a gigantic proposition, particularly in view of the fact that Whitney was so well taken care of in the proposed act that besides being the sole owner he practically carried all authority of construction in his vest pocket.

However, he was not daunted. The next year he published and distributed a pamphlet on "A Project of a Railroad to the Pacific," which showed a vast knowledge of his subject on the route proposed, which was designated by a line drawn on a map from St. Joseph, Michigan, to Prairie du Chien, Wisconsin, then straight across to Lewis and Clarke's pass in the Rockies; thence down the Clearwater and Snake Rivers to Walla Walla and the Columbia River, and across the Cascade Mountains to Puget Sound. In his pamphlet he said that he did feel that "he could not be wrong, and that Nature's God had made this for the grand highway to civilize and Christianize all mankind."

In spite of his strenuous efforts, however, he had reached the summit of his schemes, and was now destined to go down the other side. The slavery issue was crowding all minor issues out, and Whitney was fighting a losing fight. He lost a fortune, which he had made in China, in trying to arouse public sentiment, and spent his declining years in the dairy business, peddling milk.

Whitney often found himself in antagonism to Plumbe, who in the forties also kept hammering at his pet project. Whitney favored a northern route, as against a southern, stating that his researches had shown him California to be "capable of sustaining but a small population," that labor would have to be imported "from Europe to raise enough to eat," and that it would then "have nothing to sell, and nothing with which to buy."

To this Plumbe replied that "this is but a reflection on the writer's own ignorance. It appears that the nearest view this gentleman himself enjoyed of California was from Council Bluffs on the east and Canton on the west, and this fact satisfactorily accounts for his unfortunate misapprehension of the real attributes of our noble state and her golden Sierra."

To Plumbe's communication suggesting a national convention of all advocates of a Pacific road with the idea of working out a single practical plan, Whitney replied: "You speak of my project and others which you say are before Congress, but I have never even troubled myself to examine them, believing them all to have been founded upon mine, and have given them no further thought than that they would find their proper level. I have carefully read over your prospectus, and must say I am so dumb I cannot even make a plan of it at all. My course of duty is onward and alone. I fear no opposition—I fear no comparison."

The efforts of Whitney and his contemporaries, however, had done one thing of value. Prominent public men had become interested, many of their ideas being colored by the section from which they came.

Senator Benton of Missouri sponsored a line from St. Louis to San Francisco via Pueblo and New Mexico. Seward of New York favored the "National Pacific Railroad" plan of George Wilkes, of New York, which dealt rather with a plan of organization rather than any particular route. Various conventions were held and as many different schemes suggested.

In the fifties a new actor appeared on the scene, Josiah Perham of Maine and Boston, noted as being the father of our modern "cheap railroad transportation system." For many years he was well known by the fraternity of railroad officials in New England, by virtue of the fact that, starting in a small way in 1849 by inducing travelers from near-by points to journey to Boston to view the panorama "Seven Mile River," he soon branched out and during the season of 1850 it is estimated that 200,000 people journeyed to Boston from New England and Canadian points. He worked the excursion scheme for many years, having round-trip tickets good for 30 and 60 days from Boston to various points of interest, regular tours, and during Civil War days had in operation excursions to Washington.

This was his third great business venture, he having failed in the first two, and about 1853 he became interested in a railroad to the Pacific Coast. His first idea was for a road from the Missouri to San Francisco, and he clung tenaciously to the idea for several years, but the chartering of the Union and Central Pacific roads in 1862 caused him to abandon the central route idea.

In 1853, Jefferson Davis, then Secretary of War, by virtue of a provision of the Army Appropriation bill of March of that year, was given power to have all of the proposed routes surveyed by the government, for the purpose of determining the most feasible route to the Pacific.

There were five different surveying parties sent out that spring, from the 32d parallel on the south to the 49th on the north, and naturally Davis, a Southerner, advocated the extreme southern route. And when it is remembered that, but a few years before, the Mexican War had added much territory to the Southern states, it is easily seen why Davis should recommend so strongly the construction of a transcontinental railroad along that route. The results of these explorations were published in eleven large volumes.

General Dodge, who became the chief engineer of construction for the Union Pacific, says that "it is a singular fact that in all these explorations the most feasible line in an engineering and commercial point of view, the line with the least obstacles to overcome, of lowest grades and least curvature, was never explored and reported on. Private enterprise explored and developed that line along the 42d parallel of latitude. This route was made by the buffalo, next used by the Indians, then by the fur traders, next by the Mormons, and then by the overland immigration to California and Oregon. It was known as the Great Platte Valley Route. On this trail, or close to it, were built the Union and Central Pacific railroads to California, and the Oregon Short Line branch of the Union Pacific to Oregon."

As early as 1851, Dodge became interested in a Pacific railroad, and a few years later, while chief engineer of the party surveying the Rock Island extension across the state of Iowa, became committed to the Platte Valley project. For six or eight years as he had time, he devoted his energies to extensive surveys and familiarizing himself with the country along the proposed route. In the late fifties he made a report in the New York office of the Rock Island, but such was the lack of interest taken by the directors that, before the report was finished, all but two, Farnam and Durant, who out of their private funds had been paying Dodge to continue his explorations, had left the office, one of the disgusted directors saying that he did not see why they should be asked to hear such nonsense.

In 1856, both the Democratic and Republican platforms declared for a Pacific railroad, and in 1858 a committee on Pacific railroads was authorized by Congress, consisting of fifteen members.

In December, 1860, a bill introduced by Curtis of Iowa in the House of Representatives was passed, but did not get by the Senate. It is said that this bill, sponsoring a "Union Pacific Railroad," was the first introduced titling a road of that name.

With the outbreak of the War, Curtis left Congress and entered the army, but other representatives carried forward the torch and on July 1, 1862, we find President Lincoln approving a bill chartering a corporation to be known as "The Union Pacific Railroad Company." Lincoln himself had taken a lively interest in the scheme, while a railroad attorney in Illinois, and had much to do with its furtherance after he became President. He held conferences with General Dodge, as to the proper eastern terminus, and went carefully into the matter of gauge, and other details.[1]

An historian has said that in 1862 conditions were such that some sort of Federal action was logical. California, by the discovery of gold in 1848 had put herself on the map, and by the end of the following year her population had reached a hundred thousand. Naturally many of the settlers had come from the Southland and their sympathies lay with the Confederacy. There was talk of joining forces with Oregon and forming a new republic on the one hand, while the Northern sympathizers advocated a line of rail to hold their section to the Union. Some leaders of the Confederacy laid plans for sending an expeditionary force across the plains to seize California, but the initial undertaking from Texas was defeated at the New Mexico border.

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[1] See "Lincoln and the Railroads."

A few months after the legislation was enacted, an organization was effected, and Peter A. Dey, who had been associated with Dodge in some of his early work, was assigned to make a reconnoissance from the Missouri River to Salt Lake.

The purpose of the new corporation was to construct a line westward to meet the Central Pacific Railroad then building eastward from California; in fact, the latter road was expressly authorized in the act to continue construction until the two lines of rail should meet, thereby forming a continuous system.

But while the act of 1862 favored the road by authorizing a government credit and a substantial land grant, and the patriotic side of holding the Pacific Coast to the Union was stressed, the necessary private financial support was not forthcoming (we must remember this was in war-times) and it required an amendatory act in 1864, with additional concessions, to start the project moving.

General John A. Dix, of New York, was made president of the new company, and T. C. Durant, vice president. The latter deserves a paragraph to himself. Dodge says that Durant was then practically at the head of the Union Pacific interests; and the present management of the road states that he "remained the very active manager of construction" until its completion—truly a man-sized job! William O. Stoddard, Lincoln's secretary, in one of his books, refers to Durant as haunting the White House in a state of anxiety when the outcome was in doubt, and speaks of him as "one of the most remarkable looking men" he ever saw. He was "the tall, hawk-eyed man who cannot stand still, but keeps on walking, walking, up and down the room," talking to himself, trying "to build the Pacific and save the Pacific slope to the Union."

Council Bluffs, Iowa, having been determined as the eastern terminus of the new road, and the formal ceremony of breaking ground having been formally done at Omaha, just opposite, after the passage of the amendatory act, a half million dollars was spent in surveys and grading.

Peter A. Dey, with whom Dodge had been associated in some of his early work on the Mississippi and Missouri extension of the Rock Island, was appointed chief engineer, but, difficulties of a controversial nature arising, resigned in January, 1865, stating that he was relinquishing "the best position in his profession this country has offered to any man." Dodge, who was then fighting the Indians, was asked to take charge of the work, and leave of absence was granted him by his superior, General Sherman.

Meanwhile, the first hundred miles of road had been located, track-laying had commenced, and October 19, 1865, saw the first fifteen miles of track laid. The materials for use in the construction work were brought to the scene of action in various ways:

rafts on the Missouri carried the ties and bridge timber from the north; steamboats and barges brought up the steel from St. Joseph; while other materials were hauled by ox team from the Chicago and Northwestern rail terminal in Iowa.

About this time, too, the financial condition of the treasury, which was at a low ebb, was considerably bettered by an influx of eastern capitalists, chief among whom were the Ames brothers, large shovel manufacturers.

One of the persistent and vexing problems, with which the builders had to contend, was the hostility of the Indians. General Dodge has given an outline of his "organization for work on the plains," as he calls it, and states that "each of the surveying parties consisted of a chief, who was an experienced engineer, two assistants, also civil engineers, rodmen, flagmen, and chainmen, generally graduated civil engineers, but without personal experience in the field, besides axmen, teamsters, and herders. When the party was expected to live upon the game of the country a hunter was added. Each party would thus consist of from eighteen to twenty-two men, all armed. When operating in a hostile Indian country they were regularly drilled, though after the Civil War this was unnecessary, as most of them had been in the army. Each party entering a country occupied by hostile Indians was generally furnished with a military escort of from ten men to a company under a competent officer. The duty of this escort was to protect the party when in camp. In the field the escort usually occupied prominent hills commanding the territory in which the work was to be done, so as to head off sudden attacks by the Indians. Notwithstanding this protection, the parties were often attacked, their chief or some of their men killed or wounded, and their stock run off."[1]

Dodge adds that the wagon transportation was a tremendous undertaking particularly in the mountainous districts, and that at one time at least ten thousand animals were in use, the number of laborers employed as a rule being from eight to ten thousand. A visitor from the East, who witnessed a typical track-laying, has left a good description of the work.[2]

> "We, pundits of the far East," he said, "stood upon an embankment, only about a thousand miles this side of sunset, and backed westward before that hurrying corps of sturdy operators with a mingled feeling of amusement, curiosity, and profound respect. On they came. A light car, drawn by a single horse, gallops up to the front with its load of rails. Two men seize the end of a rail and start forward, the rest of the gang taking hold by twos, until it is clear of the car. They come forward at a run. At the word of command the rail is dropped in its place, right side up with care, while the same process goes on at the other side

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[1] A picturesque and vivid account of the building of this road is given, with some fictional license, in Zane Grey's "The U. P. Trail."

[2] From "How We Built the Union Pacific Railway," by Gen. G. M. Dodge.

> of the car. Less than thirty seconds to a rail for each gang, so four rails go down to the minute. Quick work, you say, but the fellows on the Union Pacific are tremendously in earnest. The moment the car is empty it is tipped over on the side of the track to let the next loaded car pass it, and then it is tipped back again; and it is a sight to see it go flying back for another load, propelled by a horse at full gallop at the end of 60 or 80 feet of rope, ridden by a young Jehu, who drives furiously. Close behind the first gang come the gaugers, spikers and bolters, and a lively time they make of it. It is a grand 'anvil chorus' that those sturdy sledges are playing across the plains; it is in triple time, three strokes to the spike. There are 10 spikes to a rail, 400 rails to a mile, 1800 miles to San Francisco—21,000,000 times are those sledges to be slung; 21,000,000 times are they to come down with their sharp punctuation before the great work of modern America is complete."

The chief of the track laying force was General Jack Casement, who had seen service in the Civil War and could be depended upon in an emergency. "At any moment," said Dodge in later years, "I could call into the field a thousand men, well officered, ready to meet any crisis or any emergency. There was no law in the country and no court. We laid out the towns, officered them, kept peace, and everything went on smoothly and in harmony. Two or three times at the end of our tracks a rough crowd would gather and dispute our authority, but they were soon disposed of."

At one time Dodge received a dispatch stating that a crowd of gamblers had taken possession of the then terminal point and refused to obey the local officers. He immediately wired Casement to take his force to that point and "clean house." How well this was done may be inferred that when, a short time later, the chief engineer repaired to the town and asked for the results, Casement took him to a new graveyard outside the town, saying that the "bad men" had all died "with their boots on."

Although the Civil War had settled the secession question, the completion of this transcontinental system was still looked upon as more or less of a military necessity, as an excerpt from a letter from General Sherman, in command in the West, to Dodge testifies.

> "I regard this road of yours," wrote Sherman, "as the solution of the Indian and the Mormon question, and therefore give you all the aid I possibly can, but the demand for soldiers everywhere and the slowness of enlistment, especially among the blacks, limit our ability to respond. Each officer exaggerates his own troubles and appeals for men. . . . So far as interest in your section is concerned, you may rest easy that both Grant and I feel deeply concerned in the safety of your great national enterprise."

Dodge states that Sherman several times each year visited the work and took an active interest in its progress, and that from General Grant, the head of the army, on down to all of the district commanders in whose sections they chanced to be operating, the most cordial support was forthcoming. Whenever provisions were low, supplies were obtained from near-by posts, and every demand was met, "no matter at what time of day or night, what time of year or in what weather."

With remarkable celerity the line pushed westward: in November, 1866, communication was opened up as far as North Platte, Nebraska; June, 1867, saw Julesburg, Colorado, reached; and in November of that year Cheyenne was the western terminus. Successively Laramie, then Benton, in Wyoming, and Wasatch, in Utah, became the terminals, and when Ogden was reached negotiations were opened with the Central Pacific regarding a meeting place.

Until almost the last, the friendliest relations were sustained with the Mormons, President Brigham Young thoroughly approving of the project and personally seeing to it that the contracts for construction over the Wasatch Mountains and westward were let to Mormons. But his head was so set upon the line passing through Salt Lake City, that when Dodge, by virtue of the topography of the country, determined to pass to the north of the lake, with a spur passing southward into the city, Young was so incensed that he went over Dodge's head and appealed to the directors. The board, however, sustained their chief engineer, and Young then threw his support to the Central Pacific in an effort to have them come around the south end of the lake, which would necessitate the Union Pacific to connect there. Feeling ran high for a time, Young denouncing the Union Pacific project and its engineer in the tabernacle, but the Central Pacific engineers determining upon a line to the north of the lake, he soon changed his tactics and again supported the Union Pacific.

It is stated that during the latter part of this construction race the grading forces of the two roads worked almost in sight of each other, the Union Pacific grading west to Humboldt Wells, and the Central Pacific surveying to a point of eighty miles east of Ogden with completed grading almost into Ogden.

Dodge relates an incident of these closing days worth the telling. It seems that the laborers on this stretch of the Union Pacific were Irish, while those of the Central were Chinese. The Irishmen, who looked down upon the "Chinks," in setting off their blasts in several instances failed to give the proper warning to the other party, in consequence of which several Chinese were injured. The attention of Dodge being called to this, he endeavored through his contractors to have the practice stopped, but without avail. Finally, the Chinese, in retaliation, set off a blast which buried several of the Irish, and after that the latter showed a wholesome respect for their yellow brothers.

Notified by the United States government that a place of meeting must be fixed. Promontory Point, near the north shore of Great Salt Lake, was decided upon, and the formal driving of the last spike there took place on May 10, 1869.

Before we consider this momentous incident, however, we shall now go back to the inception of the Central Pacific project, which in connection with the Union Pacific made possible this first great transcontinental route.

In 1854, Theodore D. Judah, a New England civil engineer who though but twenty-eight years of age, had achieved success as a railroad engineer in the East, was brought to California as chief engineer for the construction of the Sacramento Valley Railroad, the first line to operate in the state. Starting at Sacramento, and originally intended to run as far as Mountain City, in Yuba County, by the time Folsom 22 miles away was reached, the promoters found the treasury so depleted that a halt was called.

Judah saw the early possibilities of railroading in California and, in 1856, journeyed to Washington in an endeavor to arouse the interest of the lawmakers to the extent of making a Federal grant of lands to aid in extending the Sacramento Valley line into San Francisco. While his efforts were not successful, he gained such an important knowledge of lobbying that, in 1859, a California railroad convention again sent him to the capital city, this time for the larger purpose of securing "construction of a railroad from the Atlantic to the Pacific."

From President Buchanan on down, the political lights were importuned and flooded with Pacific Railroad literature, but on account of the high tension prevailing between the Northern and Southern legislators no bill was enacted. Far from being discouraged, however, Judah returned to California with the idea that the necessary legislation would eventually be enacted, and decided that he could best devote his energies towards discovering a pass for a railroad through the Sierra Nevada Mountains. In the fall of 1860, through the representations of a settler living in what was called Dutch Flat, Judah repaired thither and upon investigation believed that he had hit upon the most practicable pass that could be found across the Sierras.

Accordingly in November he drew up articles of association, and circularized the central part of the state from Sacramento to San Francisco, soliciting subscriptions for the organization of a railroad company "for the purpose of constructing a road through the state" upon the route selected by himself, a distance of 115 miles to the state line. He furthermore stated it as his belief that the route would receive the support of the California delegation and other Congressional leaders in shaping Pacific railroad legislation, thereby securing to that part of the state the western terminus of a transcontinental system.

Judah tried to enlist the support of the newspapers of both communities as well as the leading financiers. San Francisco laughed at him, and he then directed his energies to securing Sacramento support. A jeweler there by the name of Bailey, who was a friend of his, bethought himself of Leland Stanford, a member of the mercantile firm of Stanford Brothers, and enlisted his interest to such an extent that Stanford decided to see his friend Collis P. Huntington, of the hardware firm of Huntington and Hopkins, and talk over the matter with him.

Several conferences were held, at which Huntington's partner, Hopkins, and a mutual friend, Crocker, were also in attendance. The result was that an interview with Judah was secured by the "Big Four," and the engineer was instructed to go ahead with a more complete survey, and if this should show that conditions were as represented, a company would be formed.

The survey bore out Judah's contentions and, on June 28, 1861, the Central Pacific Railroad Company of California was incorporated, with a capitalization of eight and a half million. Stanford, recently elected governor of the state, was made president; Huntington, vice-president; Hopkins, treasurer; Bailey, secretary, and Judah, chief engineer.

In October, Judah was sent to Washington to further his project before the national Congress, going by way of Panama, and after his arrival had a thousand copies of a pamphlet which he had prepared printed, with rare discrimination disseminating them among not only the political dignitaries from President Lincoln and his Cabinet to Senators and Representatives, but also among those railroad men where they "were likely to do the most good," as well as the leading eastern railroad journals.

An act was passed, July 1, 1862, which assigned to the Central Pacific the construction of the road from San Francisco to the state line, and beyond if the Union Pacific had not reached that point; the amendatory act of 1864 limited the construction eastward to 150 miles beyond the state line; while two years later this restriction was removed and the company authorized to continue building eastward until both roads met.

The indefatigable Judah next repaired to New York and placed orders for iron materials, locomotives and cars, doing this entirely without authority, as on account of the war these materials were steadily mounting in price and he desired to get the benefit of the prevailing lower rate.

A few words concerning the "Big Four," as they were called, who were about to launch their enterprise, would be in order.

Huntington, who had come east in time to witness the ratification of the Pacific bill, was the financial genius of the organization, whose word was as good as his bond. When he tried to raise money in the east in furtherance of the initial project, and failed to arouse enough interest among the leading capitalists to secure the sale of bonds, he telegraphed to his three partners for a sheaf of blank notes with their endorsements thereon. Fortified with these, and further by the fact that where they came from their names stood for business integrity and success, the Eastern financiers agreed to take a certain number of the bonds, provided the promoters would guarantee the interest for a period of ten years, which was accordingly done.

Stanford achieved prominence in the political world. Qualified as an attorney, he served as governor of his state and United States senator. Generally he was regarded as possessing the most authority among his associates in the railroad promotion.

Mark Hopkins, the treasurer, was affectionately called "Uncle Mark," and has been referred to as "the balance-wheel in the company." His particular aversion seems to have been an antipathy for waste in any form; later he could be found going through the shops at Sacramento picking up bolts, nuts and other results of carelessness for the purpose of salvage.

Charles Crocker, the fourth member of the quartette, after serving for a brief time as a director, was appointed general superintendent, and, as the present Southern Pacific management states, under his direction "construction work on the original rail lines over the Sierra was carried out with such dispatch that the Central Pacific was completed seven years ahead of the time allowed by the government."

An enumeration of the difficulties which beset these promoters reads like a romance. The bankers of San Francisco said, "Don't have anything to do with those men. Don't put any money into their schemes. They are bound to come to grief." Various engineers scoffed at the idea, saying that it was an utter impossibility to build a road across the Sierra, and in addition to that, if such a road should actually be constructed, the snow during the winter months would render it inoperative, as a depth of fifty feet was no uncommon thing.

Again, under the terms of the Federal act, only American-made rails could be used, and with this restricted market the energetic home manufacturers raised the price eighty per cent. In addition to this, all the iron materials, including the rolling stock, manufactured in the North, had to run the gauntlet of Confederate vessels and shipwreck, it requiring from eight to ten months to round the Horn and land the supplies at San Francisco. We are told that during the War transportation rates advanced 275 per cent, and an additional 17 per cent insurance rate prevailed. The first locomotive received cost $2,300 for freight alone, and a later one $8,100. During the later construction period, when it was necessary to have the materials more promptly, the Isthmus of Panama route was often used, but the charges here were no mere bagatelle; a shipment of eighteen locomotives cost the company over $84,000 in freight, or an average of over $4,500 each. The charges on rail were over $50 a ton, the rail standing the company over $140 delivered in Sacramento. The total cost of the first twenty engines received was over $400,000, but it was absolutely necessary to have these engines in order to keep the supplies up with the work. So Huntington merely gritted his teeth and got out another sheaf of notes.

But this was not all. In addition to the antagonism of the moneyed interests of San Francisco, the papers were almost an entity in condemning the project, and in some quarters official investigations as to alleged swindles were indulged in.

The problem of labor was a vexatious one. Aside from the prevailing high rate of pay, the average Californian wanted to mine rather than do a day's labor. When he did take a job with the construction gang, he usually worked only long enough to accumulate enough to go afield prospecting. If the rumor of a large "find" came to his ears, he and most of his associates would join the mad stampede to the new gold fields. It is stated that during one of the stampedes two thousand laborers were sent to a certain point before a gang of a hundred men could be induced to stay, the great majority signing up simply to get their transportation over the mountains.

With the first real attempts to sell stock, further active opposition developed. The promoter who opened an office in San Francisco for this purpose, in the twenty-two days he held on, sold only fifteen shares to three subscribers. Large financial interests bucked them: the telegraph companies, on account of the new competing line which would be put up; the steamship and navigation companies, because of their future loss in transportation; the stage and express companies and toll roads, for the same reason; a prominent ice company which hitherto had supplied ice from Alaska, saw the revenues cut down when the inland lakes could be made the source of supply; and contractors who had previously enjoyed a monopoly in supplying the Indian agencies and army posts joined the large procession of malcontents. But in spite of these formidable obstacles the project was launched.

✓ On January 8, 1863, the formal breaking of ground occurred, at Sacramento, with the usual ceremonies. A dozen orators, including some of the promoters, held forth, and a brass band furnished the music. The very skies seemed inauspicious for the commencement of the undertaking; the river had overflowed its banks, and the ground surrounding the stand holding the chief figures was adorned with bales of hay, which had been placed on the mud for the benefit of the spectators.

Meanwhile, actual work had already commenced, but it was not until the latter part of October, when the first shipload of iron materials arrived, that any track was laid. On the 26th, when the first rail was placed, the matter of another formal celebration was broached, but Huntington opposed it so strenuously that the idea was abandoned.

"These mountains look too ugly," he said, "and I see too much work ahead. Any little nobody can drive the first spike; but there are months of hard labor and unrest between the first and last spike. The last spike is the one we'll celebrate."

It is a matter of regret to note that Judah, who had started the ball rolling, now left the enterprise and, a short time after, died in New York from a fever contracted while crossing Panama.

The first section of eighteen miles was finished to what is now called Roseville, February 29, 1864, and the progressive builders immediately advertised their wares.

"The road is constructed in the most substantial manner," said the notice, "and is provided with new first-class passenger cars, which run with a smoothness not excelled by any other road in the United States. It is laid among the foothills, affording delightful views of valley and mountain scenery. Travelers will find every convenience to promote their comfort."

At the suggestion of Crocker, who said that a race which could build the great wall of China could build a railroad, the decision was made to employ Chinese, not primarily because of the cheapness of their labor, but on account of a shortage of white laborers. Crocker's argument proved very practical. The first fifty Chinese employed measured up to expectations so well that an additional fifty were hired, and after that they were brought in large numbers; indeed, before the road was completed, 12,000 yellow-skinned men were on the payroll, four-fifths of whom had been imported from across the Pacific.

An interesting story is told of how a hoisting engine was brought from Sacramento to assist in the construction of what was called the Summit Tunnel, the longest of fifteen used in crossing the Sierras. Practically dismantled at Sacramento, it was hauled to the end of the tracks, which then happened to be at Gold Run, and after removing the wheels was placed on a logging truck, drawn by ten oxen, and driven by a character known as "Missouri Bill." "The black picked goose," as the engine was nicknamed, then started on its way, and some way it must have been.

> "All went well until a half mile east of Dutch Flat," says an old Southern Pacific pensioner who received the story from Missouri Bill, "Here the engine received its first cussing, for she had been the cause of a stampede of a ten-mule team. Anyone familiar with mules knows that when they start something they usually finish to a queen's taste with a lot of broken gear. From that day on, the 'black goose' raised hell on the trail. Word of the dread spectacle passed speedily into the back country and it was with fear and trembling that those in charge of emigrant wagons of prairie schooners tackled the trails in that vicinity. There was trouble every day while she was on her way up the mountain. Even the stage-coach horses would balk at the sight of her. We finally resorted to the expedient of blindfolding the mules and horses that had to pass, because we found that whenever they caught a glimpse of the locomotive they took either to the hills or the ravines, whichever looked best to them at the moment, and were not particular what they took along with them. I will give the mules credit, however, that before starting they did their best to kick everything loose. . . . After that the only serious sufferers were the traveling men who were too busy to listen to advice. It mattered little whether it was a young team they drove or an old pair of skates traveling along with their

heads down; one look at the 'goose' and they forgot everything and dashed away for the hills."

However, after a tedious journey of six weeks, the engine reached her destination on the summit, and was put in operation running the hoisting works in the shaft sunk there.

Finally came that momentous 10th day of May, 1869, when the two roads joined, and the ceremony of driving the last spike at Promontory Point took place. Many artists have depicted the scene, for it was one of deep national significance.

About five or six hundred spectators were there, among them a detachment of troops from Fort Douglas, with a military band. "An air of cosmopolitanism" pervaded the scene, as Dodge has said, what with the motley groups of Chinese, Mexicans, Indians, half-breeds, negroes, Irish and other laborers; the Chinese laying the last rails from the west, and Irish from the east.

Telegraphic communication was so arranged that each blow of the sledge could be reported to all parts of the Union. The last tie was placed under the rails by the construction superintendents of both roads after which a prayer was offered. While gold and silver spikes were presented by several of the neighboring states for the ceremony, the last spike, which was of gold, was the gift of California. Excitement was at such a fever pitch that the railroad officials who participated in the spike-driving usually failed to hit the spike at all, striking the tie instead.

Two engines facing each other then steamed together until they touched noses, after which the engineers of each broke a bottle of champagne on the other's engine.

Following the ceremonies, the official parties repaired to the cars of the Central Pacific, where other bottles of champagne were opened, but for a different purpose, and much oratory was indulged in.

In all parts of the country celebrations were held. In New York a salute of a hundred guns was fired, and the mayor sent a message across the continent to the mayor of San Francisco which read: "Our flags are now flying; our cannon are now booming; and in old Trinity a Te Deum imparts thankful harmonies to the busy hum about her church walls."

Dodge, in his hour of success, sent a message to General Sherman, his old commander, and in reply received one commencing thus: "In common with millions, I sat yesterday and heard the mystic taps of the telegraph battery announce the nailing of the last spike in the great Pacific road. Indeed, am I its friend? Yea."

This ceremony took place over seven years before the time limit set. In his "Across the Plains," Robert Louis Stevenson has said:

> "When I think of how the railroad has been pushed through this unwatered wilderness and haunt of savage tribes; how, at each stage of the construction, roaring, impromptu cities full of gold and lust and death sprang up and then died away again, and are now but wayside stations in

the desert; how in these uncouth places pigtailed pirates worked side by side with border ruffians and broken men from Europe, talking together in a mixed dialect mostly oaths, gambling, quarreling and murdering like wolves; how the plumed hereditary lord of all America heard in this last fastness the scream of the 'Bad Medicine Wagon' charioting his foes; and then when I go on to remember that all this special turmoil was conducted by gentlemen in frocked coats, and to nothing more extraordinary than a fortune and a subsequent visit to Paris, it seems to me, I own, as if this railway were the one typical achievement of the age in which we live; as if it brought together into one plot all the ends of the world and all the degrees of social rank, and offered the busiest, the most extended, and the most varying subject for an enduring literary work. If it be romance, if it is contrast, if it be heroism that we require, what was Troy to this?"

To-day in retrospect—only sixty years after that golden spike was driven—we see the great West threaded with its iron bands. The buffalo and the Indian are gone. The silent places of desert and mountain have one by one yielded up their secrets. The transcontinental traveler embarks in a solid Pullman train in Chicago and after only three nights on the road reaches the Coast—a destination which, three generations ago, was weeks away.

Not one transcontinental line, but many, now link the East with the West. The Union Pacific system, the pioneer from the East, now operates a total main-track of almost 10,000 miles, or three times the distance across the continent. The Southern Pacific, successor to the original Central Pacific, operates a longer trackage than any other railroad in the United States, embracing 13,500 miles in the United States; a ramification of 1,400 miles into Mexico; 800 miles of electric lines; and a line of steamships covering 3,800 miles, linking the Gulf ports with New York and the East.

But amid all this splendid luxury of modern travel, let us give a thought to those two gallant bands of men, fighting their way across the continent from west to east and from east to west, until they met at Promontory Pass. It was of such men as these that Walt Whitman sang in his poem: "Pioneers, O Pioneers!"

XVI

THE SANTA FE TRAIL AND THE SANTA FE ROAD

Possibly no trail of the Old West is quite so famous as the Santa Fe. How many high deeds of romance and adventure, hardships and suffering, cluster about it! If we turned aside to tell of even a few of these, a whole book could easily be filled—but this is a story of railroads, and we can tell only enough about the old trail to give our crossties proper foundation.

As early as the 16th century at least three noted Spanish explorers penetrated the region west of the Mississippi along the route of what was later known as the Santa Fe trail: Cabeza de Vaca, who apparently followed the valley of the Arkansas into what is now New Mexico; Vasguez de Coronado, who crossed the plains of Kansas; and Luis de Moscoso, who followed in his trail.

About the middle of the 16th century the Spaniards first came to what is now the site of Santa Fe, then an Indian pueblo, and fifty years later established a colony there.

The next hundred years were spent in maintaining their foothold in New Mexico, often suffering serious reverses, but it was a century before they had complete control of the situation. And another hundred years later a census taken by the Spanish officials showed a population for New Mexico—then rated as a Spanish colony—of approximately 29,000 persons, of which two-thirds were Spaniards and the rest Pueblo Indians. Of course this did not take in the untamed tribes.

In 1716 a party of fifteen hundred Spanish emigrants left this point for the purpose of establishing a colony in the valley of the upper Mississippi, but was practically annihilated en route.

From 1821, when Mexico broke loose from Spanish domination, until 1846, when during the Mexican War General Kearny established his provisional government of the territory at Santa Fe, New Mexico was a part of the Mexican republic.

The Santa Fe Trail was the natural outcome of what has ever been the American spirit of aggressive business methods combined with an inclination not always to see the means but the end.

Bradley, historian of the Santa Fe road, says that for almost a century after the ill-fated Spanish expedition in 1716 no white man appears to have crossed the plains. But in 1804 an enterprising Illinois merchant sent on a trading expedition up the Platte River an employee who did not come back with the spoils. He reached Santa Fe and started in business for himself with his employer's money. The following year another American merchant made the same journey and settled in Santa Fe.

In 1806-07 Zebulon M. Pike of the United States

Army, while engaged in geographical explorations in Louisiana Territory, particularly with reference to the Arkansas and Red rivers, penetrated unknown western wilds, discovering the mountain that bears his name in Colorado, and finally constructing a fort within the northern confines of New Mexico along the Rio Grande under the erroneous impression that he had reached the Red River and was on American soil. But he was soon disabused upon the arrival of a superior Spanish military force, which prevailed upon him to visit Santa Fe for the purpose of visiting the governor of the territory. Pike afterwards described his impressions of his first view of old Santa Fe, saying that "its appearance from a distance struck my mind with the same effect as a fleet of flat boats which are seen in the spring and fall seasons descending the Ohio."

The treatment accorded Pike was all that could be desired and he was next sent to the Commandant in Chihuahua. While on the road he passed two large caravans bound for New Mexico on a trading journey which made a decided impression on his mind. Returning safely to American territory Pike published his report of the expedition, which aroused widespread interest among his countrymen, particularly those along the frontier who were engaged in mercantile pursuits.

The first trading venture resulted disastrously. In 1812 a party of Americans who sallied forth were thrown into prison at Santa Fe and their goods confiscated, the authorities believing them to be spies.

Here they languished for nine years or until Mexico threw off the yoke of Spanish dominion. By a strange trick of fate, that same year of 1812 another American trader reached Santa Fe and finished his venture so successfully that he returned to the States ready for another.

From this time on, American traders invaded New Mexico in increasing numbers and the ventures were generally successful. In 1824 a mammoth caravan carrying merchandise worth $25,000 first established the fact that this trading could be indulged in on a gigantic scale, and with other vehicles than the pack-mule which had been used by individual traders heretofore. And this time also, the Mexican government adopted a more friendly attitude to outside capital. Trade rapidly increased, in spite of the fact that the Indian tribes along the route were not of the friendliest. And while at last the American government was obliged to take some action in guarding the large caravans as far as the Mexican line, the smaller ones were left to shift for themselves. Yet the dauntless American spirit could not be quenched and, as Bradley says, "the history of the Santa Fe Trail abounds with stories of Indian raids, pillage and bloodshed."

The business continued to increase and the beginning of the thirties saw Independence, on the Missouri River, as headquarters for the trade. Merchandise was sent by boat from St. Louis to Independence, whence it took the Santa Fe trail overland. The little border town was in her heyday. Annually she saw the departure of thousands of vehicles drawn by oxen and mules for Santa Fe, 850 miles away. She was headquarters for thousands of meat-packers and teamsters.

It was often customary for different caravans to meet at Council Grove, 150 miles out of Independence, and effect a sort of organization, as they would shortly enter Indian territory. Here a "Captain" would be chosen who appears to have been such in name only. To him was turned over a list of men and wagons belonging to each party, and from this list a roster was made of all those able to stand guard duty.

The trip consumed about twelve weeks and was replete with all kinds of happenings: Indian scares, both false and real; the hunting of buffaloes and the attendant change in diet; oxen stampedes; the fording of swollen streams.

Nearing their destination a select group, consisting of the proprietors of the merchandise stock, would advance ahead of the caravan and proceed to Santa Fe to negotiate with the custom officials for the tariff duties to be paid and the storekeepers for the sale of their merchandise.

But the arrival of the main body of the caravan was the big thing in the lives of the residents. Throngs of people crowded around the big wagons, among whom was a considerable number of petty thieves. The "wagoners" all "slicked up" for the occasion, would vie with each other in cracking their whips, while keeping an eye open for some fair senorita whom he would see later. This was a gay time for Santa Fe: the dance halls would do a flourishing business and the local gambling fraternity would find kindred spirits.

Meanwhile, the traders would be engaged in disposing of their stock, after satisfying the custom officers, to local shop-keepers and those coming from the outlying district. After tarrying about a month the party would turn its nose homeward again laden with goods secured from the Mexicans.

Santa Fe, at this time, must not have been an exemplary city from a moral standpoint, as this excerpt from an article written by one who had made the journey, to an eastern paper about 1831, testifies:

> "To dignify such a collection of mud hovels with the name of 'City' would be a keen irony; not greater, however, than is the name with which its Padres have baptised it. To call a place with its moral character, a very Sodom in iniquity, 'Holy Faith,' is scarcely a venial sin; it deserves Purgatory at least. . . . Gambling is here authorized by law. It is as respectable to keep a gambling house as it is to sell rum in New Jersey. . . . The Generals and the Colonels and the Majors and the Captains gamble. The judges and the lawyers and the doctors and the priests gamble, and there are gentlemen gamblers by profession."

With the passing of the years the business continued to hold its own, and in 1846 just before Kearny's invasion, the annual trading caravan consisted of 414 wagons carrying a stock worth a million and three quarters dollars.

With the territory ceded to the United States, a new impetus was given to trade and an immigration movement set in. In 1849 a monthly stage service was put in effect between Independence and Santa Fe, and a correspondent in a Missouri newspaper, the following year, wrote concerning them:

> "The stages are gotten up in elegant style and are each arranged to carry eight passengers. The bodies are beautifully painted, and made watertight with a view of using them as boats in ferrying streams. The team consists of six mules to each coach. The mail is guarded by eight men, armed as follows: Each man has at his side, fastened in the stage, one of Colt's revolving rifles, in a holster below one of Colt's long revolvers, and in his belt a small Colt's revolver, besides a hunting knife, so that these eight men are ready, in case of attack, to discharge 136 shots without having to reload. This is equal to a small army armed as in ancient times, and from the looks of the escort, ready as they are either for offensive or defensive warfare with the savages, we have no fears for the safety of the mails."

It took a month to make the trip each way.

The year 1850, a census taken showed that New Mexico now had a population of sixty thousand souls, not counting the Indians, and ten years later this had increased twenty thousand.

About this time the usual railroad agitation began to appear. Cyrus K. Holliday, Kansas pioneer, has been called the "Father of the Santa Fe Railroad."

Coming to Kansas from Pennsylvania in 1854, after having cleaned up twenty thousand dollars in a railroad deal in his home state, he immediately became prominent among the "free-soilers." Helping to found Topeka he was also instrumental in having it made the state capital in 1859. Holliday now conceived the idea of a large rail system, over the route of the old Santa Fe Trail, from the Missouri River to the quaint old Spanish town. While many pet local projects were authorized by the legislature in the fifties and sixties the great majority of them died in the making. The craze for internal improvement there can only be compared with that in many of the states preceding the great panic of 1837.

On February 11, 1859, the "Atchison and Topeka Railroad Company" was granted a charter with a capitalization of a million and a half dollars, with the privilege of increase "from time to time, to any sum not exceeding the amount expended on account of said road, divided into shares of $100 each." This charter was written by Holliday himself, but as with earlier similar organizations, the project was allowed to languish for a year and a half.

Then came the Civil War, which stopped things again, but Holliday and his fellow-backers were undaunted. They sought an enabling land grant, and finally, on March 3, 1863, with the affixing of Abrahim Lincoln's signature the prayer of the petitioners was granted and Kansas, which had been admitted to statehood in 1861, was given a land grant "in alternate sections to aid in the construction of certain railroads and telegraphs in said state."

Two roads were provided for: one from Leavenworth to the "southern line of the state in the direction of Galveston Bay, in Texas," by the route specified, with a branch from Lawrence; the other from Atchison, via Topeka, to the "western line of the state, in the direction of Fort Union and Santa Fe, New Mexico," also with a branch. And in common with similar legislation it was specified that if any of the roads and branches were not completed within ten years the unsold lands should revert back to the United States and no further land sold.

The next year the state legislature formally accepted the land grant and authorized certain counties to issue bonds after subscribing for stock in the companies.

Holliday was a man of indomitable energy and perseverance, pushing ahead in spite of the many obstacles which still lay in the way of achieving his dream. Eastern prejudice against the construction of a railroad across Kansas had to be overcome, and necessarily much of the financial support had to be secured from that section. The accomplishment of this was due in no small measure to the acquisition by Holliday of a large tract of desirable land on the Pottawatomie Indian reservation west of Topeka. Amounting to four hundred thousand acres the steady sale of these lands almost immediately brought into the treasury several hundred thousand dollars with more in prospect.

In November, 1868, the actual construction of the road commenced. There were the usual attendant services with a flow of oratory, during which a remark by Holliday that those assembled would live to see the day when the road would be in operation to Santa Fe was greeted with laughter.

Holliday was fortunate in his chief engineer and contractor, Thomas J. Peter of Cincinnati, who must have been somewhat of a character. While he neither drank, smoked, nor chewed, his vocabulary when occasion demanded was most extensive. In five years he had put the Santa Fe road on the map.

Starting at Topeka, the idea was to proceed southwest with Burlingame as the first objective. Burlingame was twenty-five miles away, and as shown by a copy of the first time-table issued by the Santa Fe, on June 28, 1869, a regular train service was established between Topeka and Carbondale, an intermediate point, a distance of seventeen miles. The promoters of the road were fortunate in that by virtue of the Kansas Pacific's having been opened to Topeka in 1866, materials from the east by way of Kansas City could be brought thereon.

About this time Lyons County, which would be the next county to be traversed, voted in favor of issuing bonds to help the good cause along, and the correspondent from Emporia, the county seat, wrote to his Topeka paper:

> "Say to your numerous readers that there will be two railroads to Emporia in a year from now and tell Holliday, Lakin and the eastern men to hurry up their cakes. Things are lively here. Lots that went begging at $500 three months ago are readily gobbled at $1,000 now. About one hundred men are in town awaiting the result of the railroad vote. Had it been adverse they would have skedaddled to-morrow. As it is, they remain and go to work to-morrow. . . . General Schofield arrived to-day. . . . No one knows his mission. He is dressed as a citizen and doesn't sport any fancy dogs or willow jugs."
>
> And another correspondent from the same town wrote that "everything is lovely and the goose was never more loftily suspended."

By August, 1870, Emporia, 34 miles away, was reached. The following year the road was extended to Weston, 78 miles away. Here work was halted, due to various unsettling conditions. Less than two years remained of the stipulated time for building the road as far as the Colorado state line, but the line itself was in some dispute; also money was tight and interest rates high. It was estimated that five million dollars more would be needed to reach Colorado. How would they get it? There was actually over 300 miles of track yet to be laid.

By some form of wizardry the necessary finances were forthcoming and the road was completed within the specified time. On March 31, 1873, the directors in their annual report claimed 497 miles in operation, which included a branch running from Newton to Wichita, seven-tenths of which had been built within the last year. And the appurtenances were all first-class, from its road-bed and section houses to its depots and rolling-stock. The report further disclosed that of gross earnings amounting to almost $1,200,000, less than three-fourths were paid out for expenses.

The construction of the line to Atchison opened up connections with several other important lines, while the route through Kansas stimulated the cattle-raising industry. Several of these cattle towns became famous, probably the most picturesque being Dodge City. One valuable thing which the Santa Fe land department did in connection with its campaign of disposing of the Federal land grants, was the inducing of fifteen thousand Russo-Germans to emigrate to America and colonize along the Santa Fe road.

By the latter part of 1877 almost 800 miles of railroad were in operation, the line to Pueblo, Colorado, being opened March 1, 1876.

At this time the road called in the services of William B. Strong, a railroad man of twenty years' experience, who interested himself in completing the line to Santa Fe, and if possible, still further westward. The company had long since caught the vision of the Pacific Coast. Strong paid a personal visit to New Mexico, then a Territory, but could make little headway there. A rival road, the Denver and Rio Grande, was seeking entrance; and certain restrictive legislation on the statute books further complicated matters.

The far-sighted Strong prevailed upon his road to appropriate $20,000 for a preliminary survey, and then ordered his chief engineer, Robinson, to Raton Pass, on the line between Colorado and New Mexico, the only feasible route into northern New Mexico. Strong saw that if energetic measures were not taken at once, the Denver and Rio Grande would gobble up the pudding. By a coup d'état Robinson beat the rival road, by minutes, and possession being nine points of the law, won the day.

After many vicissitudes, Santa Fe was finally reached on February 9, 1880, by means of a short branch running from Lamy. Due to the topography of the country, it had been found from an engineering standpoint to be impracticable to construct the main line direct to old Santa Fe and this was the alternative. A little over a month later, the main line entered Albuquerque. Its total length including all branches at this time now totaled 1,318 miles. Coincident with this disappeared the old Santa Fe Trail as such, and its romance was gone forever.

By October 1st, San Marchial, 103 miles south of Albuquerque, was reached; from this point construction was made under a different corporate name, the Rio Grande, Mexico and Pacific Railroad.

In March, 1881, Deming was reached, and as the time when the Santa Fe could build its own line into California was still remote, connection was made with the tracks of the Southern Pacific, which permitted through shipment to the Coast—a move of great advantage to the Santa Fe.

In this same year the road pushed more directly to the south, tapping the Mexican border at El Paso, and establishing connection with the Mexican Central Railroad, running to Mexico City. From a timid little road of a few years before reaching out a few miles into Kansas, its tentacles now began to suck nourishment from the entire Southwest; but these same tentacles likewise brought life-blood into many far-flung communities. For a successful railroad can only prosper by bringing prosperity into the country itself.

About this time, Strong (who was well-named) succeeded Nickerson as president, and under his able administration great things were accomplished. A policy of vigorous expansion was pushed, and in the face of herculean obstacles, for Strong was pitted against some of the best railroad brains in the country—such men as Huntington and Gould. However, as Strong himself said: "A railroad to be successful must always be a progressive institution. It cannot stand still, if it would. If it fails to advance, it must inevitably go backward and lose ground already occupied."

By the end of 1887, by ownership and control, the Santa Fe system operated almost 7,400 miles of railroad, from Chicago and Lake Michigan, on the east, to San Francisco and Los Angeles, on the west coast; from Denver in the heart of the Rockies to the Gulf of California; and from northern Kansas, its original starting-point, to the Gulf of Mexico. It was but another splendid dream of those early "visionaries" come true.

XVII

OTHER GREAT TRANSCONTINENTAL SYSTEMS

The Northern Pacific Railroad

In preceding chapters I have discussed the central lines which were the first to link the East with the West; and also the lines tapping the rich Southwest. But in the north railroad promoters were by no means idle, and the story of how the great Northwest was pierced is as full of romance as any. Through this virgin section went such lines as the Northern Pacific, the Great Northern, and the Chicago, Milwaukee and St. Paul.

Historians tell us that the first white men who explored any portion of the region now traversed by the Northern Pacific and Great Northern railroads, were two French traders, Radisson and Groseilliers, who about the middle of the seventeenth century penetrated the borders of what is now the state of Minnesota. They were followed a quarter of a century later by Father Hennepin and Du Luth, and still later by Verendrye, the French explorer who penetrated what is now North Dakota in his endeavors to add to the dominions of France in North America.

In 1763, Jonathan Carver, starting from Connecticut with the avowed intention of crossing the continent to the Pacific Ocean, got as far as the Minnesota River only. In the latter part of the 18th century, Alexander McKenzie, of the Northwest Fur Company, starting at Montreal, after various vicissitudes finally reached the Pacific Coast, the first white man to cross the continent above Mexico.

Coming further down we must not forget to mention the explorations of Zebulon M. Pike, Lewis Cass, Stephen H. Long and Henry Rowe Schoolcraft, all of which added to the knowledge of the great unconquered Northwest.

To Thomas Jefferson, while President of the United States, must be accorded the palm for setting in motion the forces which, above all others, were responsible for awaking the nation to the possibilities which lay west of the Mississippi Valley. While serving his first term he interested Congress in voting a sum of money "for sending an exploring party to trace the Missouri to its source, to cross the Highlands, and follow the best water communication which offered thence to the Pacific Ocean." To head the expedition he chose his secretary, Meriwether Lewis, who in turn selected his friend William Clark as his chief officer. These selections proved wise, as any student of American history knows. They finally reached the mouth of the Columbia River, and, returning to St. Louis after an absence of over two years, were greeted with wild acclaim. The results of their discoveries were invaluable.

In the early fifties, Edwin F. Johnson, who in

1826 had advocated a line of rail from the Hudson to the Mississippi, became interested in a Pacific railroad, while working on the construction of a midwest line. Johnson's route was by way of the Missouri and Columbia rivers. In 1853 he published a volume setting forth very clearly his ideas as to why the Lewis and Clarke route should be followed in any transcontinental railroad building. That same year surveying parties were sent out by Jefferson Davis, Secretary of War, and the extreme northern route party was placed under the command of Major Isaac I. Stevens, an eminent army officer and engineer. This was by his own request, and upon his arrival in Washington Territory he was to assume the office of Governor.

Stevens divided his party in two companies: one under command of Captain George B. McClellan (the later famous general), to start at Puget Sound and operate east; the other, under his own supervision to start from St. Paul, and proceed west. McClellan, with that faculty for seeing the difficulties and obstacles which lay in his path, as evidenced by his conduct during the Civil War, spoke disparagingly of some of the results of his survey, while Stevens, on the other hand, became more firmly than ever an advocate of a northern route by way of either the Missouri or Yellowstone valley. In season and out of season he advocated his route, not only on account of the advisability and practicability as he saw it, but also because of the country it would open up. But on account of the recent admission of California as a state, and the consequent airing of the views of the new representatives in Congress in favor of a road terminating at San Francisco, the northern route project lagged.

During Buchanan's administration Stevens tried to enlist sentiment in favor of Federal aid in the construction of a Pacific road as a military measure, but while the flood-gates of oratory were opened, this too failed. However, in passing it is significant to note that in 1860 Representative Curtis of Iowa, introduced his bill in the House which left out of the reckoning both the northern and southern routes, and substituted therefor a central or middle route, the forerunner of the Union Pacific. In this year also the name "Northern Pacific Railroad Company" first appeared in Federal legislation looking to a Pacific road, when Senator Wilkinson of Minnesota offered as an amendment to a bill passed by the House subsidizing the central and southern Pacific routes a land grant for a northern route also, which legislation failed of passage.

At this stage of the game another Stevens appeared on the scene, in the person of the powerful Thaddeus Stevens, a Congressman. He had become interested through the representations of Josiah Perham, a new England promoter who had long advocated a rail route to the Pacific. Stevens' first efforts in the House failed, but he was instrumental in reporting a new bill which passed both houses and was signed by President Lincoln, July 2, 1864.

This was entitled "A Bill granting lands to aid in the construction of a railroad and telegraph line from Lake Superior to Puget Sound, on the Pacific Coast, by the Northern Route," and while conforming in some particulars to the Union Pacific bill, it was specifically stated that "no money should be drawn from the treasury of the United States to aid in the construction of the said Northern Pacific Railroad."

While the leading promoters of the new project were New England men, and were the backbone and sinew of the corporation, yet 135 persons were named in the bill as commissioners of the new road, from various parts of the country. Many of them were political dignitaries and army officers who may not have known what they were on the roll for, and it is not surprising that when the first meeting of the board was held, September 1, 1864, 33 commissioners were present and 102 absent. Twenty of these were from New England states.

Subscription books were opened and the necessary sale of 20,000 shares of stock solicited in order to elect a Board of Directors and set of officers. Seventy-five more than the required number of shares were subscribed for the company organized, with Josiah Perham as President. It is an interesting commentary in looking over the list of stockholders to observe that the number of shares subscribed for ran from one share to 4,000 shares; Perham himself subscribed for *ten*.

This road, in common with the earlier pioneer roads, now had to direct its energies towards interesting capital in its construction. At one hundred dollars a share, a payment of ten per cent on the stock should have poured over two hundred thousand dollars in the treasury, but as one of the first acts which the commissioners authorized was the payment of costs in time and money "incurred in obtaining the charter," the probabilities are that practically none of it was available for the work which now lay before the corporation. And it is an interesting fact that when, six years later, the directors importuned the original subscribers for the other ninety per cent, they refused, and the directors then voided the entire original subscriptions.

In the latter part of 1865 things began to move. Fluent promoters began to circulate in New England and there was much talk of making the proposed line a great transcontinental system with connections in Canada and New England. But the enterprise lagged; Perham's ideas as to a great popular outpouring of the mass for stock subscriptions did not materialize. As he himself admitted, the new corporation had no credit, no money in the treasury, and were behind in office rental and clerical hire payments. A new organization was effected and Perham stepped down and out. Thus was another visionary disillusioned and another railroad proposition tottered on the brink. A few years later poor Perham died practically penniless.

The history of the next few years is not dissimilar to that of many other large enterprises. One group of promoters succeeded another, striving to put their great project on its feet. But hundreds of miles separated the people back East from the Northwest Coast—miles filled with mountains, rivers, deserts, Indians, and other more imaginary obstacles. So it is not strange that these hard-working promoters failed. While preliminary surveys were made, the needful cash to make the dirt fly was not forthcoming.

The famous bond house of Jay Cooke and Company became interested in the venture, and tried to enlist both foreign and local capital. A widespread advertising campaign was launched, to educate the public on the advantages of the Northwest and the great benefits to be derived from the proposed Northern Pacific road. A perusal of this literature is very illuminating. Cooke spoke of the "mildness" and "remarkable modification" of the climate; the "adequate supply of atmosphere moisture for all purposes of agriculture and stock-raising;" even making allowance for the "detached portions of the vast region tributary to the Northern Pacific", "yet even in such localities the grazing is usually good," "the wonderful network of living brooks, lakes, streams, and navigable rivers"; "the materials for the greatest lumber trade the world has seen"; "the richest mineral deposits on this continent"; the soil which would yield "immense crops of grain, fruit and vegetables"; the domestic cattle which "range out all winter and are fat in March"; and the Mexican horses, which "turned out to shift for themselves on the fall of snow," "come in in the spring fat, sleek and strong."

Continuing he said that "pages of incontestable evidence could be introduced to prove that nowhere in the world can such large crops of wheat, barley, rye, oats, potatoes and other roots be raised"; "nowhere in the world are there such apples, pears, plums and cherries"; "fruit trees invariably bear generally in two, at most in three years, from the graft"; that "insects destructive to fruit are unknown"; that "nowhere do shade, fuel and fruit trees grow so rapidly," and "that nowhere is such possibility of grazing cattle in vast herds without shelter, prepared fodder, or case, as exists all over the regions to be traversed by the Road on both sides of the Rocky Mountains, whose universally diffused 'bunch grass' has justly given to it the name of the 'graziers' paradise.' "

And making all due allowance for exaggeration he was not far wrong in many of his statements, although in the period following the financial crash of 1873 he was accused of gross misrepresentation.

In the summer of 1870 construction was commenced in Northern Minnesota, which was a veritable wilderness. Indeed, the first thousand miles of construction must be made through a vast uncivilized region, with practically no white population. It would encounter difficulties such as most of our other roads did not experience. No immediate business could be expected until after its projection, and emigrants had been induced to settle along its right-of-way. All labor and supplies would have to be brought along, entailing a great additional outlay. In Montana there was a sparsely settled region which was soon succeeded by another stretch of wilderness until the western extremity was reached with its embryonic beginnings. However, the Pacific Coast settlements were far advanced and there would be found food supplies and the commerce incident to ocean and river transportation.

The next few years saw construction pushed forward, a great influx of money in the treasury and the control of the St. Paul and Pacific Railroad secured. But as in similar enterprises a dark day was dawning and hopes were again to be blasted.

The panic of 1873 wiped out the house of Jay Cooke and Co. and sent the Northern Pacific tottering. It owed Cooke about a million and a half, and while in the stress of the moment it was claimed on the one hand that it was responsible for the wrecking of Cooke, on the other it was stated that Cooke was responsible for the railroad project that was going on the rocks. The road was facetiously termed "Jay Cooke's banana belt." But neither was wholly right.

By this time about 450 miles had been constructed. A plan of reorganization was effected, and General Lewis Cass, who had been president at the time of the crash, was appointed receiver. He resigned soon after and was succeeded as president successively by Charles B. Wright, Frederick Billings, and Henry

Villard. Under each some progress was made, and Villard's energetic control witnessed the actual completion of these lines of rail which had so long tantalized their promoters. But it was not until the comparatively late date of September 8, 1883, that the lines reaching east and west were joined and the last spike driven in. The ceremony took place near Gold Creek, Montana, and was attended by many distinguished people, including General Grant, William M. Evarts, and Carl Schurz.

The present management of the Northern Pacific has lent the writer a most interesting volume of contemporary press clippings, which tempt one to quote at every turn, if for no other reason, the exuberance of language employed. But we must remember that this was the coming of the first railroad into the country, a thing dreamed of and worked for during the entire lifetime of some of the celebrants. Says one paper:

> "The signal that the spike was about to be driven was flashed into the operating room at 6:14 P. M. St. Paul time, and in another moment was heard on the sounder the instantaneous report sent by contact of spike and sledge hammer—'tick, tick.' Then came a pause and then there were three more ticks in quick succession, as if Mr. Villard, impressed with the great importance of the event, had struck the spike twice, slowly and deliberately, and had then handed the hammer to General Grant, who, inspired by the occasion with some of his youthful vigor, had struck two rapid blows,

and then hit her once more for the cigars! Boom! went the gun in Smith Park, joyfully pealed the bells and shrill and sharp blew the whistles in the city of St. Paul. The last spike had been driven. The Northern Pacific Railroad, conceived nineteen years ago, was completed. The great work had come to a successful completion."

On September 3rd the St. Paul celebration occurred, and the occasion was graced with the presence of President Chester A. Arthur, his Secretary of War, Robert T. Lincoln, General Grant, General Phil Sheridan, and many other statesmen and dignitaries, including representatives from various foreign countries. Commenting, a local paper said:

"It is not impious to say that heaven itself smiled on St. Paul's gala day. A sky of Minnesota's bluest and brightest, a sun beneficent, and air like wine—what would you, what could any one ask more, meteorologically? And then the enthusiasm. There was enough of it to have survived the drenchings of a thunder shower or the blinding shadows of a storm. It is, presumably, the reporter's province to be superlatively adjectivial even upon small provocation. In what condition is he, imagine, in trying to do descriptive honor to an event which, in all truth and soberness, cannot be too highly lauded? Superb, grand, beautiful, elegant—it was all of these and more. It was unique in conception and execution so far as one of the greatest features—the industrial exhibit—was concerned. The decorations alone were worth a journey from Portland to St. Paul to see. The

> blaze of color dazzled, the multiplicity of pattern and design bewildered; but the beauty gave the last and lasting impression. The massive buildings had new dignity loaned by their deckings; the ordinary gained the gala air to fullest extent, while even the rudest fruit or cigar stand effervesced into an excellence no one would have dreamed it possible of acquiring. The procession moved as if by clock work, not a serious accident marring the miles of route, while not an iota of space was wasted. So far as details are possible they are given below, but none know better that the writers how bald the descriptions necessarily are."

The banquet which followed at the Hotel Lafayette surpassed, in the opinion of the reporter, anything ever given in the West up to that time. President Arthur in the course of his remarks said that he had just traveled "one thousand miles on the rails of the Northern Pacific road. Nothing that I have ever read; nothing that I have ever heard, has so impressed me with the resources of the Northwest. It has convinced me that the importance of this enterprise which we are gathered here to honor, has not yet been overrated even by its most sanguine friends."

Henry Villard, president of the new road, spoke of the fact that a great amount of work still remained to be done and that the property must grow apace with the states and territories traversed by their lines. "In other words," he said, "our policy must be such as will promote the growth of those states and territories." He paid his respects to Wall Street, as have many others.

"It has been a great satisfaction to me," he continued, "that there are more believers in the Northern Pacific Railroad in the great Northwest than in Wall Street (great applause) and I feel satisfied that the manipulations of railroads in Wall Street will not shake the faith of the city of St. Paul, or the State of Minnesota or of any of the states or territories traversed by the lines of the road. I am glad that, for a time at least, I am myself emancipated from the demoralizing influence of Wall Street. I breathe freer here."

While the oratory was flowing, the modest Grant "had lighted his cigar and puffed away contentedly, as of yore."

One of the speakers was J. J. Hill, then president of the St. Paul, Minneapolis and Manitoba Railway. He referred to the fact that the roads were now neighbors and while rivals in business, the rivalry was "an honorable, fair competition." He paid his respects to Villard and of the changes that had taken place within a few years. "Thirteen years ago," he said, "I made my first trip to the northern part of Minnesota on a dog train. Three dogs took my traps and my grub (as it is called there) over 200 miles. It took me many days. Last Saturday I made the same trip in a few hours, and through cultivated fields of wheat."

Thus was launched a great system which to-day has a trackage of almost 7,000 miles and, as Mr. Hill eloquently said, has transformed the silent plain into prosperous communities and blossoming fields of wheat. This and the other great lines of the North have been the magic keys to a princely domain.

The Great Northern Railroad

The inception of the Great Northern, like the Northern Pacific, should be traced to the very first explorers who made their painful way across the continent. Its actual history also dates back to the Stevens expedition of 1853, already referred to, but, like other road-building ventures of the day, its record is but a series of failures until the advent of James J. Hill, in 1879.

As early as 1857 a road was chartered in the then Territory of Minnesota, known as the Minnesota and Pacific Railroad Company, but after building 62 miles of track out from St. Paul it gave up the ghost. The state took over the property and, after further delay due to the outbreak of the Civil War, a new corporation was effected, called the St. Paul and Pacific Railroad Company. It immediately became active and, on July 2, 1862, a line ten miles long from St. Paul to St. Anthony was put in operation. A wood-burning locomotive, called the "William Crooks," the first to enter the state, puffed its way along the short track with a string of passenger coaches.

The new organization planned a set of aggressive measures, but in 1872 another financial collapse forced a complete shutdown. Things dragged along for seven years when that great builder, James J. Hill, appeared on the scene. He and his associates, through foreclosure proceedings, secured control of the St. Paul and Pacific and reorganized the corporation under the name of "The St. Paul, Minneapolis and Manitoba Railway Company."

Hill is the patron saint of the Great Northern. Their publications teem with reference to "the man whose rare vision and genius for accomplishment made him the greatest figure in the development of the Northwest." Just two years ago (1926) an imposing monument to him was erected in the Central High School grounds at Superior, Wisconsin, and an official publication said that as it was a replica of the one standing in the grounds of the University of Washington at Seattle, "it seems to us a happy circumstance that these similar monuments should adorn the grounds of the greatest educational institutions at the extreme eastern and western termini of the Great Northern Railway." And indeed, we cannot but consider with admiration that great figure: farm lad, shipping clerk, contractor, lumberman, speculator, empire builder!

Only six years after taking hold of the defunct St. Paul and Pacific, fifteen hundred miles of road were in operation and the road was on its feet financially and physically. This one sentence of recorded fact is as eloquent as tons of biography!

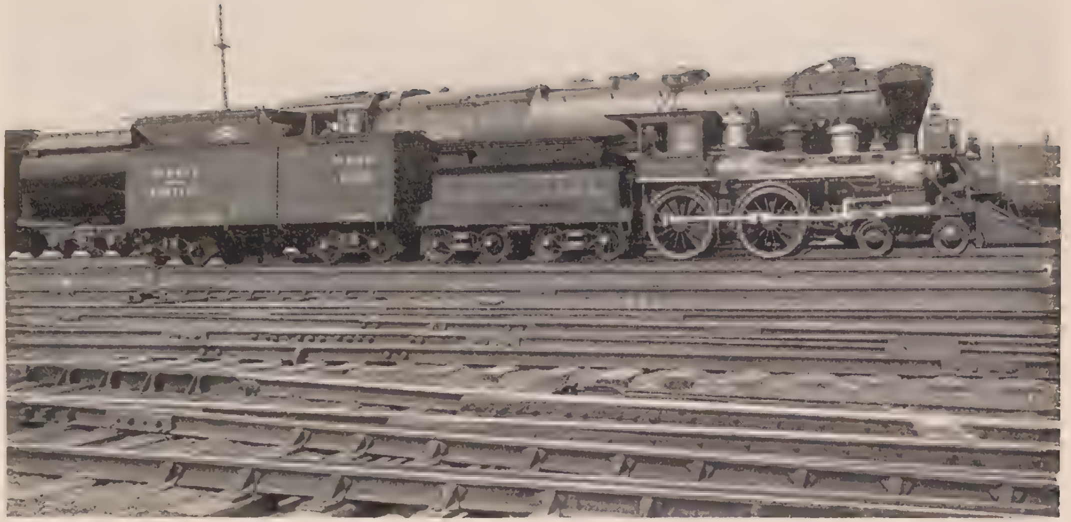
Hill at once saw that the salvation of the road lay in its reaching tidewater. In 1889 he began actively building toward the Coast, and four years later his dream was realized and the trains of the Great Northern steamed into the terminal at Puget Sound. Of all the difficulties encountered and successively solved by his engineers we have not space here to treat. The story of one outstanding obstacle is typical.

When Isaac I. Stevens, pioneer explorer, was leading his little band across the Rockies, one of his objectives was the locating of a pass used for generations by the Blackfoot Indians, called Marias Pass. He sent two scouting parties to the headwaters of the Marias River to find it, but without success. It remained for another intrepid man of the same name, John F. Stevens, to solve the riddle. This assistant engineer of the Great Northern located Marias Pass in December, 1889, after a journey full of hardships and with the thermometer registering forty degrees below zero. But his road had given him orders to find that pass, and what was winter or the snow-clogged defiles of the Rockies, to stop him!

John F. Stevens has since received many honors: the Fritz Medal for "outstanding accomplishments in engineering," which has been accorded only to such men as Edison, Kelvin, Bell, Marconi, Wright, and Goethals; he has been in charge of operation of several important roads; he was head of the American Railway Advisory Commission in Russia during the War; and he was chief engineer of the Panama Canal. But we fancy that, as he looked back over the accomplishments of a busy, useful life, nothing gave him more inner satisfaction than finding that pass through the Rockies!

James J. Hill has passed on, but his mantle fell upon able shoulders. Continual improvements are being made on this progressive line. For another example—prior to the year 1900 the summit of the Cascades was negotiated by a zig-zag line known among railroaders as a switchback. In that year a tunnel, nearly 13,000 feet long, was built, boring through the mountain in a direct line and doing away with the former slow and arduous operation. But as traffic grew, steam operation became more difficult and, in 1925, electrification of that part of the line was inaugurated. And in 1927 the last step was taken when President Budd announced the immediate undertaking of a new tunnel on a lower level, which will be, when completed, the longest tunnel on the American continent. This tunnel will replace four miles of existing tunnels, will save about one thousand feet of rise and fall over the present summit, will substitute ten miles of straight line for eighteen miles of crooked; and finally will save one hour in the running time of passenger trains and about twice that amount of time for freight, so important an item in these days of speed.

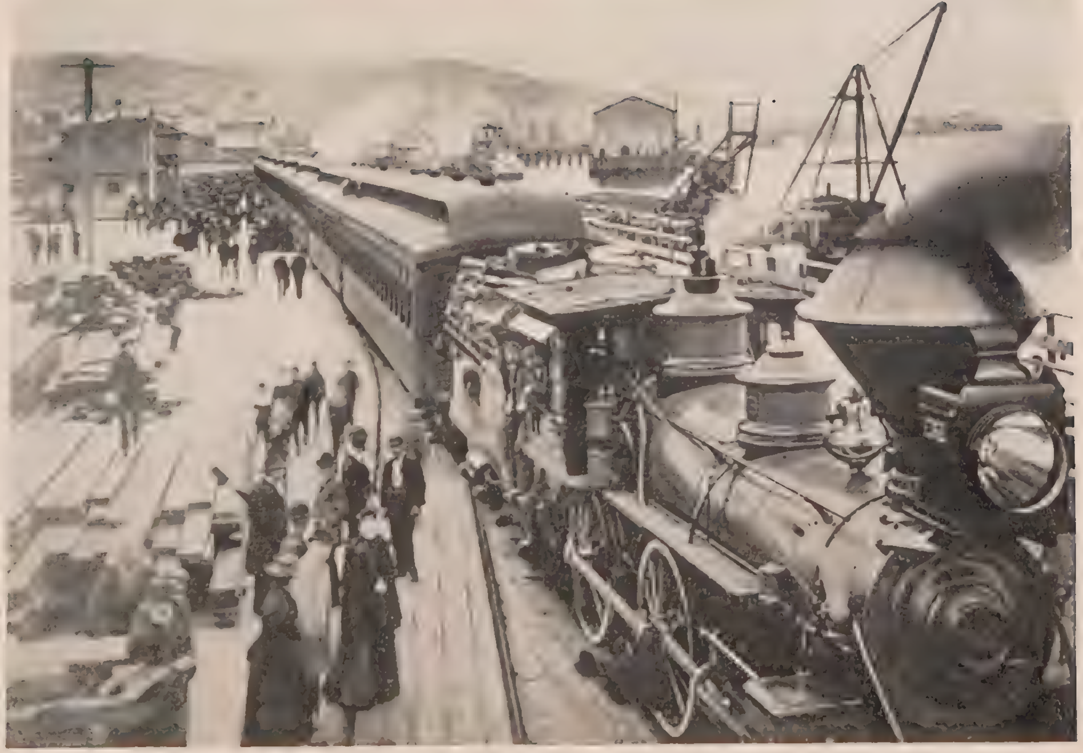
To-day the Great Northern system operates over 9,000 miles of main-line trackage, and, since 1901, together with the Northern Pacific, has had control of the Chicago, Burlington and Quincy; and it is not at all improbable that within the next few years it



Courtesy, Great Northern Railroad

THE "WILLIAM CROOKS"

A Civil War type of engine shown side by side with a modern giant, locomotive No. 2030 of the Great Northern



Courtesy Great Northern Railroad

TAPPING THE PACIFIC

First train arriving at Portland, Oregon, May 16, 1898 will merge with its old competitor, the Northern Pacific.

The Chicago, Milwaukee and St. Paul Railway

Another great trunk-line which pierces the Northwest is the Chicago, Milwaukee and St. Paul, now operating 11,000 miles of track, or, if laid end to end, enough to extend nearly halfway around the globe. Yet this system, likewise, is the product of the past seventy-five years, and much less time than that in its major construction. It was born of the Milwaukee and Waukesha Railway, chartered in 1847.

The following year the first construction was made and it was decided then to make an extension from Waukesha to Madison and thence to a point in Grant County on the Mississippi River. Two years later the name of the corporation was changed to the Milwaukee and Mississippi River Railway and, in 1851, the line was put into operation between the original terminals, Milwaukee and Waukesha. After reaching Madison construction was prosecuted westward with the result that, five years later, the line was opened as far as Prairie du Chien. In the meanwhile, a parallel line to the north was projected and Milwaukee was connected with La Crosse, on the Mississippi River.

In 1863 the Milwaukee and St. Paul Railway Company was chartered by the state, with the idea of establishing a rail connection between the two cities named. This organization secured control of the Milwaukee and Mississippi River road, as well as several other smaller corporations, and on June 28, 1865, the new company was formally organized in Milwaukee, and Alexander Mitchell, of that place, was chosen first president. Under his management the road prospered, but for two years nothing was done towards furthering the project of making an extension into Minnesota, which was one of the main objectives.

However, in August, 1867, the management purchased two roads then being constructed and also secured a ferry connection across the Mississippi.

The newly acquired projected roads were to run from McGregor, in Iowa, to St. Paul, Minnesota, by way of Austin, in the latter state; while the ferry connection was to be about fifty miles south from La Crosse, just opposite McGregor. And by November that same year (1867) the completed line was opened to St. Paul, thereby establishing the first rail connection between Minneapolis and Chicago by way of the Twin Cities.

In February, 1874, the corporate name was changed to the Chicago, Milwaukee and St. Paul Railway Company, by which it is known to-day. The far-sighted promoters saw that, with the steadily increasing settlement of the country and the attendant increase in the volume of business to be done, they should have their own terminal at the Michigan lake metropolis.

By 1900, although the corporate name remained unchanged, its lines of rails had penetrated Iowa, North and South Dakota, Missouri and upper Michigan, and totalled over 8,000 miles of road. It had bridged the Mississippi at five points and touched the Missouri at five others. Like our other great transcontinental systems, it was opening up hitherto undeveloped country, but the officials then in charge of the road desired to expand still further; a Pacific outlet was desired.

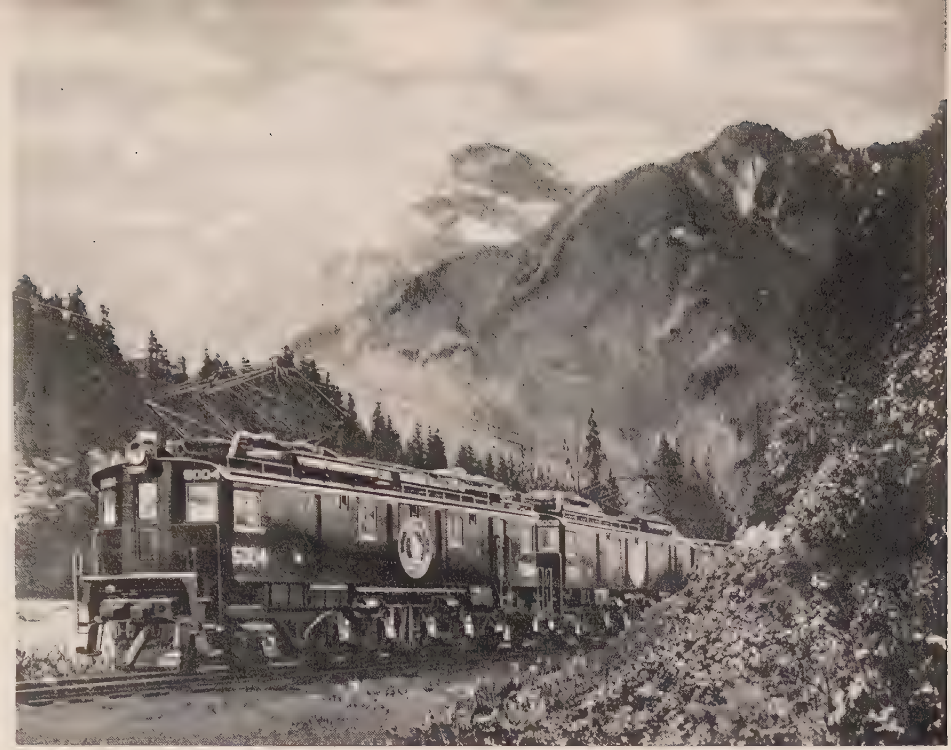
Accordingly, three different preliminary surveys were made in that same year directed towards San Francisco, Portland, and Puget Sound. After the surveys and reports were carefully scrutinized the latter route was decided upon, and the officials lost no time in beginning grading and track-laying. This was started at both ends of the line—Tacoma and Seattle in the west, and Mobridge, South Dakota, in the east. Mobridge is on the eastern bank of the Missouri River, and an engineering problem was immediately encountered here. A stream subject to tremendous floods must be bridged. This was done, and to-day concrete piers hold up an impressive steel bridge sixty feet above water-mark.

Within three years after this long western line was begun, its 1,500 miles of trackage had been completed. In July, 1909, "the last spike" was driven at a point in Western Montana. An historian says that this was a "record job from start to finish," crossing "Dakota prairies, Montana plains, the three great mountain ranges of Montana, the Idaho Pan-Handle, the Eastern Washington hills and valleys, the Cascade Mountains" and ending at "tide-water on Puget Sound." This road "traversed canyons, climbed steep slopes and dug under the gigantic bulwarks of the West in scores of places, swung along on the ridges of lofty valleys and skirted the banks of wonderful mountain rivers. Its route through the mountain regions required the bridging or filling of many deep ravines, tunneling many of the innumerable rocky promontories that buttress the ranges, and winding from side to side of steeply-walled canyons in the effort to develop distance sufficient to surmount great altitudes on easy gradients."

The next great step in the development of the "Milwaukee," as it is known, was the electrification of the sections passing through the mountainous districts.

The initial project was for a distance of 440 miles, from Harlowton, Montana, to Avery, Idaho. This was completed by the latter part of 1915, and a second zone, in the state of Washington, from the western terminal of Tacoma to Othello, 209 miles away, was likewise electrified. This electrification was concluded in November, 1919. The combined total of 649 miles gives to the Milwaukee the distinction of having far and away the longest electrified line of any railroad in the world.

Some seventy specially constructed electric locomotives are used on these stretches which, it is claimed, release two hundred or more steam locomotives for use on other parts of the road, and the annual saving by this innovation is estimated at



Courtesy, Great Northern Railroad

WHERE STEAM YIELDS TO ELECTRICITY

A powerful electric locomotive, its current generated by mountain torrents, easily pulling its long train of coaches through the Cascades

Courtesy, Great Northern Railroad

MOUNTAIN RAILROADING

The "Oriental Limited," crack train of the Great Northern, in the Cascade Range about 300,000 tons of coal and forty million gallons of fuel oil. Hydro-electric power is used, the current for which is generated at various plants, the largest being at Great Falls, Montana, on the highest of the three falls on the Missouri.

An interesting fact in connection with this electrification lies in the use which can be made in braking trains on mountain grades, known as regenerative braking. By reversing the motors on these electric locomotives they are converted into practical generators, the momentum of the train down-grade producing an electric current, which is returned to the trolleys through the pantagraph to be utilized by other trains on the attendant ascending grade. Another advantage besides this economic factor is that it curtails the use of the air-brakes and relieves both the wheels and rails of the wear which results from the grinding of brakes going down a heavy grade.

The Atlantic and Pacific Railroad

This chapter would not be complete without mention of the now-forgotten Atlantic and Pacific Railroad, which by act of Congress, approved July 27, 1866, was authorized to locate, construct and equip a railroad and telegraph line "beginning at or near the town of Springfield, in the state of Missouri, thence to the western boundary line of said state, and thence by the most eligible railroad route as shall be determined by said company, to a point on the Canadian River, thence to the town of Albuquerque, on the River Del Norte, and thence by way of the Agua Frio, or other suitable pass, to the headwaters of the Colorado Chiquito, and thence along the 35th parallel of latitude as near as may be found most suitable for a railway route, to the Colorado River, at such point as may be selected by said company for crossing; thence by the most practicable and eligible route to the Pacific." In addition, it was authorized to construct a branch "from the point at which the road strikes the Canadian River eastwardly, along the most suitable route as selected, to a point in the western boundary line of Arkansas, at or near the town of Van Buren."

A land grant was authorized; the capital stock was to consist of a million shares at $100 each; the company was to begin work within two years, and the entire main line to be in operation by July 4, 1878.

Nothing was done for several years on the "35th parallel route" as it was popularly known, despite the fact that the land grant gave the promoters forty million acres, because of the financial conditions existing during the aftermath of the Civil War.

On October 25, 1870, a consolidation was made with the South Pacific (not Southern Pacific), which operated a line from Pacific City near St. Louis across southwest Missouri. The new company, called the Atlantic and Pacific, by the following June had completed the line across Missouri and entered Indian Territory. The Pacific Railroad of Missouri, now the Missouri Pacific, which then had a length of 580 miles, was leased, and both roads failed, receivers being appointed. An organization of bondholders bought in the road and formed a new corporation, the St. Louis and San Francisco Railroad Company.

From such inauspicious beginnings has come the present-day St. Louis-San Francisco Railway, commonly called the "Frisco," with its trackage of 5,000 miles, its eastern terminals at St. Louis and Birmingham, and its western in the states of Texas, Oklahoma, and Kansas.

XVIII

THE EVOLUTION OF MODERN PASSENGER SERVICE

The Sleeping-Car

"It is a far cry," says the Pullman Company in a recent statement, "from the initial trip of the first Pullman sleeping-car, on the first day of September, 1859, on the night run from Bloomington to Chicago, to our modern, de luxe passenger service in its various forms."

And yet this innovation, a landmark in railroad travel, was not the first attempt of its kind. As early as 1836 the Cumberland Valley Railroad in Pennsylvania inaugurated a sleeping-car service of a kind between Harrisburg, the capital city, and Chambersburg.

In 1843, when the whole length of the Erie road could be traversed in a journey of three hours, two "Diamond Cars," as they were called—the "Erie" and the "Ontario"—were installed. These cars were built at Stephenson's car works at Harlem and were taken to Piermont by ferry-boat. For a while the "Ontario" was operated on a train called the "Thunder and Lightning Milk Train" running from Piermont to Otisville.

These cars were intended for the use of the passengers in reclining or sleeping, they were eleven feet wide, (and it should be remembered that the gauge of the Erie tracks was six feet), and contained six seats on each side, placed back to back, each set of passengers facing the other set.

The principle of the "berths" was simple. When the passengers wished to rest, a bar was slid from under a seat on the aisle side and fastened to a frame under the opposite seat. The removable seat cushions were then laid on this bar, the other end being supported by a contrivance along the wall, while the back cushions were laid on the seats. The principle was not unlike that still in use.

It was early found that they were too cumbersome for practical use on this road, and eventually they were used as bunk cars for track laborers. Stephenson constructed six cars of this type before he finished the job and, years later during the litigation between Pullman and Wagner on the matter of alleged infringement of patent rights, these facts were brought out and a compromise effected. The cars received the name of "Diamond" from the fact that the windows were diamond shaped, due to the sides of the frames being constructed in trestle form.

Previous to this, in the early days on the Erie, an experiment was introduced for rendering night travel more pleasant. This invention, if such it may be called, was peddled about by hawkers who infested the Jersey City terminal and sold for one dollar each. It consisted of a piece of steel to which were attached four other pieces of the same metal crosswise, the main piece being just long enough to reach from a person's back to his head. When the wearied passenger wished to retire, he simply placed this contrivance between his back and the seat of the car, and rested his head thereon. And still later, about the time when the Erie started to run its trains through to Jersey City, the pioneer "chair-seat" was originated. This had a higher back than the ordinary seats, and was reversible with a head-rest much like a barber chair.

Other eastern roads tried similar plans to that of the Cumberland Valley road, but in a sporadic way. Little attention was paid to the comfort of the night traveler, and it was rather expected that he would stop off at hotels, if on an extended journey. It remained for a young man, George Pullman, then a contractor of Chicago, to teach the railroads that travel at night could be made quite as comfortable as that by day.

George M. Pullman was a native of New York and at an early age entered into the cabinet-making business of his brother. It was while riding one night on one of the embryonic sleeping-cars running between Buffalo and Westfield that he first conceived the idea of an improved sleeping-car. But it was not until he had established a paying contracting business in Chicago that he began active work upon his plans.

> "In 1858 Mr. Pullman came to Bloomington," says Leonard Seibert, an employe of the Chicago and Alton Railroad, "and engaged me to do the work of remodelling two Chicago and Alton

> coaches into the first Pullman sleeping-cars. The contract was that Mr. Pullman should make all necessary changes inside of the cars. After looking over the entire passenger car equipment of the road, which at that time constituted about a dozen cars, we selected coaches Nos. 9 and 19. They were forty-four feet long, had flat roofs like box cars, and single sash windows, of which there were fourteen on a side, the glass in each sash being only a little over one foot square. The roof was only a trifle over six feet from the floor of the car. Into this car we got ten sleeping-car sections, besides a linen-locker and two washrooms—one at each end."

Oil lamps lighted the cars; they were heated with box stoves and were upholstered in plush. There being no porter in those days, the beds were made up by brakemen. All this remodelling was done without blue-prints and the completed job cost Pullman about $2,000 for the two coaches.

Mr. J. L. Barnes, who acted in the capacity of conductor of the sleeping-car on its trial trip, says that he wore no uniform and was attired in citizen's clothes, a badge being his only distinguishing mark.

> "All the passengers were from Bloomington," said Barnes in relating his recollections, "and there were no women on the car that night. The people of Bloomington, little reckoning that history was being made in their midst, did not come down to the station to see the Pullman car's first trip. There was no crowd, and the car, lighted by

candles, moved away in solitary grandeur, if such it might be called. . . . I remember . . . I had to compel the passengers to take their boots off before they got into the berths. They wanted to keep them on—seemed afraid to take them off.

"The first month business was very poor. People had been in the habit of sitting up all night in the straight-back seats, and they did not think much of trying to sleep while traveling. . . . After I had made a few trips it was decided it did not pay to employ a Pullman conductor, and the car was placed in charge of the passenger conductor of the train which carried the sleeping-car, and I was out of a job."

Mr. Barnes' description of the first car as he recalled it is interesting.

"The first Pullman car was a primitive thing," he said. "Besides being lighted with candles it was heated by a stove at each end of the car. There were no carpets on the floor, and the interior of the car was arranged in this way:

"There were four upper and four lower berths. The backs of the seats were hinged, and to make up the lower berth the porter merely dropped the back of the seat until it was level with the seat itself. Upon this he placed a mattress and blanket. There were no sheets. The upper berth was suspended from the ceiling of the car by ropes and pulleys attached to each of the four corners of the berth. The upper berths were constructed with iron rods running from the floor of the car to the roof, and during the day the berth was pulled up

> until it hugged the ceiling, there being a catch which held it up. At night it was suspended about half-way between the ceiling of the car and the floor. We used curtains in front and between all the berths. In the daytime one of the sections was used to store all the mattresses in. The car had a very low deck and was quite short. . . . There was a very small toilet room in each end, only large enough for one person at a time. The wash-basin was made of tin. The water for the wash-basin came from the drinking-can, which had a faucet so that people could get a drink."

Mr. Pullman, however, by no means rested on his oars after building his first type of car. He was continually experimenting and improving in the matter of details. He was a man of remarkable vision and looked far into the future, believing that the best was none too good for the modern traveler. The year 1865 is memorable in his work as seeing the first "Pioneer" car ready for service. It was constructed in the Chicago and Alton shops and cost $20,000—an unprecedented sum. Many who first saw it laughed at his "folly," but such was his own faith in the new design that he placed the suffix "A" on the car, in anticipation of still later requirements. His plans, however, were so well drawn that the only changes in later dimensions have been in length.

This car and a later one of the same series were placed in service on the Chicago and Alton road. Soon after, the Michigan Central inaugurated a sleeping-car service on its own lines, but using the earlier types of cars. It was then an interesting question as to whether the public would prefer the older type of car at a lower rate, to the "Pioneer" with its luxuries and higher tariff. The railroad officials believed that the older, cheaper car would win out; but Pullman predicted that the new style would eventually put the old out of business. At the latter's suggestion, both types of cars were operated on the same trains as an experiment, and the results bore out his contention. As one writer has aptly said, "the only travelers who rode in the old cars were those who were grumbling because they could not get berths in the new ones."

With a description of Pullman's new type of "Pioneer" car, in the *Daily Illinois State Register* for May 26, 1865, we close our account of these embryonic Pullman attempts.

> "This carriage," says the Springfield correspondent, "which we had the pleasure of inspecting during the stay of the train at our depot, we found to be the most comfortable and complete in all its appurtenances, and decidedly superior in many respects to any similar carriage we have ever seen. It is fifty-four feet in length by ten in width, . . . Besides the berths, sufficient in number to accommodate upwards of a *hundred passengers*, there are four staterooms formed by folding doors, and so constructed with the berths that the whole can easily be thrown into one apartment. When the car is not used for sleeping purposes, as in the day, every appearance of a berth or bed is con-

> cealed, and in their stead appear the most comfortable of seats.
>
> "Westlake's patent heating and ventilating apparatus is applied so that a constant current of pure and pleasant air is kept in circulation through the car. In fact, it is useless to attempt to enumerate, in so brief a notice, even a few of the many improvements which have been introduced by the patentees into the carriage, rendering it as they have, superior to any that we have ever inspected. To one fact, however, we will refer in this connection, as especially conducive to the comfort of the traveling public, viz., that a daily change of linen is made in the berths of this new carriage, thereby keeping them constantly clean and comfortable, and rendering the car much more attractive than are similar carriages where this is neglected."

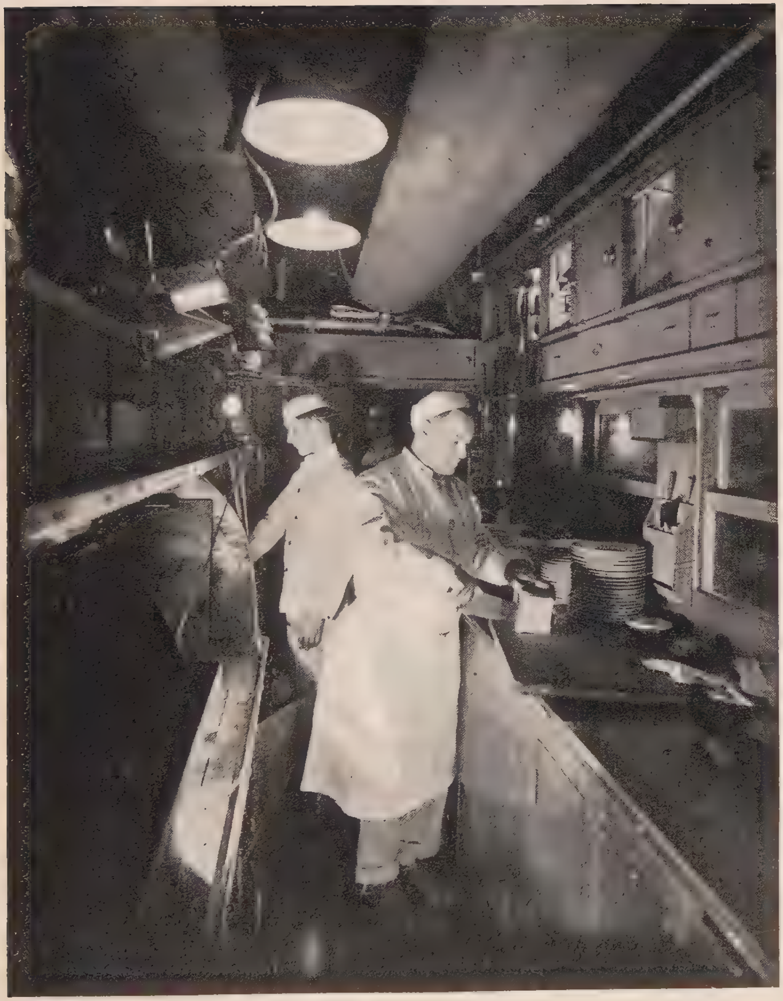
The italics concerning the number of patrons to be accommodated are ours; but we may pardon his extravagant estimate as he waxed enthusiastic on the latest "carriage" to come to his attention. A contemporary state journal of the period in paying its respects to the innovation refers to the prophecy made but a few years before, that the "time was not far distant when . . . the public would travel upon them with as much ease as though sitting in their parlors, and sleep and eat on board of them with more ease and comfort than it would be possible on a first class steamer."

The *Chicago Tribune* (June 20, 1865) said in speaking of the unspeakable conditions which had previously existed, and which were to be no more with the advent of the Pullman car, that no more would you need to think "of changes of cars by night, and rushes for seats for your party by day, of seats foul with the scrapings of dirty boots, of floors flowing with saliva, of coarse faces and coarse conversation, of seats you cannot recline in, of the ordinary discomforts of a long journey by rail."

The Dining-Car

The "diner," as we travelers of rapid speech soon termed it, was really an evolution from the sleeping-car type. It was born of a combination called a "hotel car."

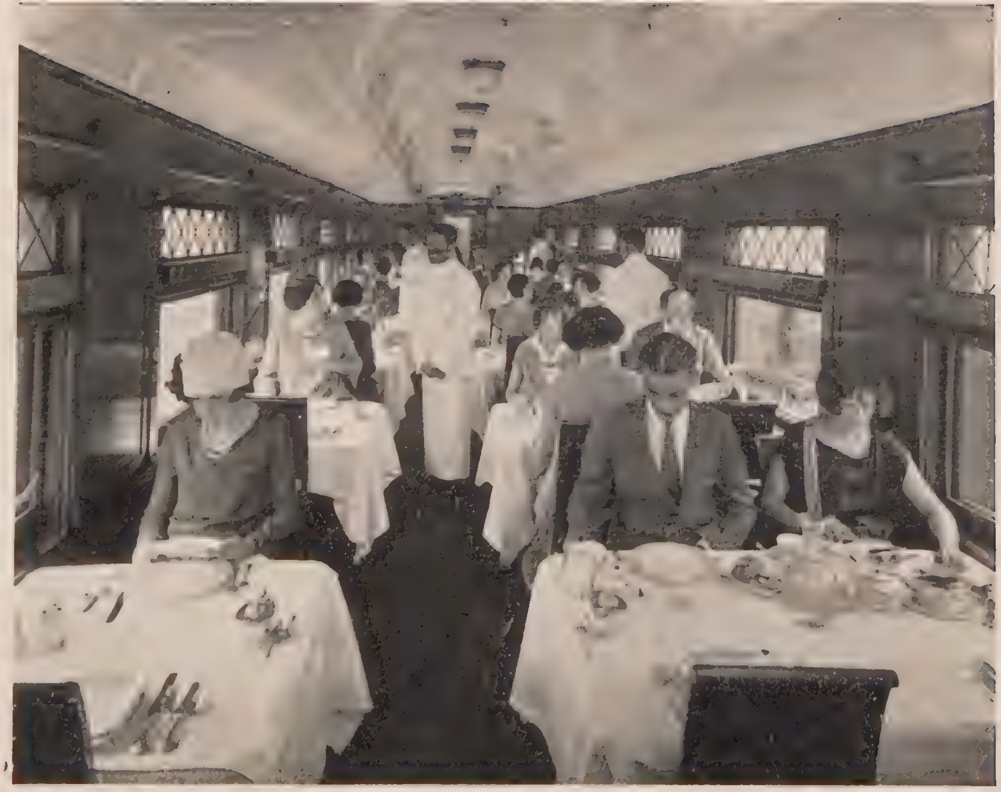
In 1867 the Pullman Palace Car Company was incorporated, for the purpose of not only manufacturing but also operating sleeping-cars—a policy which it has pursued successfully ever since, its cars being run under its own name and by special arrangement with various roads. In this same year, the "President," the first "hotel car," was put into service on the Great Western Railroad (now the Grand Trunk) of Canada. This was a Pullman creation, and the only difference between it and the ordinary "sleeper" was that a kitchen was installed in one end, the meals being served on small tables set up in the sections. A comparison of the bill of fare and prices with those of to-day elicits a pang of regret for the "good old days."



Courtesy, Great Northern Railroad

COOKING AT SIXTY MILES AN HOUR

Scene in the kitchen of the Oriental Limited dining-car



Courtesy, Sante Fe Railroad

IN A MODERN DINING-CAR

Contrast the luxury and comfort of this Fred Harvey Diner with conditions of

The menu called for oysters raw, fried and roasted, the raws being listed at fifty cents and the others at sixty; various kinds of cold meats at forty cents, with chicken and lobster salads at fifty cents each; if one wanted a broiled dinner, beefsteak or mutton chops with potatoes could be had for sixty cents, while ham and potatoes were sold for fifty; eggs prepared in all ways were to be had for forty cents, and as this was in pre-Volstead days an omelette with *rum* could be procured for a half dollar; and tea and coffee were added for an extra quarter each. On November 1, 1875, the Erie, which at that time did not operate on its own tracks from the Atlantic seaboard to Chicago, inaugurated a through Pullman service between New York and Chicago running in conjunction with several other roads. This included sleeping-cars, "hotel coaches" and drawing-room cars. The menus in these early diners, which still were a combination of sleeping and kitchen-cars, included a cuisine far in advance of anything yet attempted. All kinds of game and meats were specialized in, and if the price were paid, the traveler could have his choice of prairie chicken, pheasant, woodcock, snipe, quail, golden plover and blue-winged teal, venison, chicken, tongue, ham, corned beef, sardines, lobster, bacon, mutton and lamb chops, veal cutlets, and sirloin steak. And the hotel car itself was a decided step in advance of its predecessors in that it contained, in addition to sleeping compartments and kitchen, a smoking room for the men and a separate toilet room for ladies.

The *New York Tribune* in referring to the new service stated that while the waggish question of "where is the barber shop" was often made, yet "this too may come, as last summer an excursion party of ladies and gentlemen took a hair-dresser with them over the Erie to Niagara Falls, and two or three ladies actually *had their hair crimped* while traveling thirty or forty miles an hour"—a prophecy which has been amply verified in our day.

As early as 1868, Pullman constructed an all-dining-car which he called the "Delmonico" and which was operated on the Chicago and Alton. This car, which was soon followed by others of similar type operated on various roads, consisted of a dining room in the main body, with a kitchen and pantries at one end.

The inauguration of this dining-car service accentuated a condition which still prevailed on all of the transportation systems of the country, and is the more remarkable when we consider how far American railroads had advanced in so many phases of equipment construction. The railroad officials had always frowned upon the custom of travelers passing from one coach to another, on account of the danger involved in so doing, since there were no safeguards to prevent the passengers from falling off the moving trains. A few desultory attempts were made with canvas devices but, proving impracticable, were discontinued. However, under the new régime, the operating officials were compelled to encourage this passage from coach to coach in order to get customers for their diners. As necessity is the mother of invention, Pullman set his wits to work and the result was the existing vestibule train as we now know it.

Due to the whims and preferences of local travelers in different sections of the country, the Pullman Company soon found that it could not operate its diners successfully. It has therefore leased or sold its cars of this type to the various roads, while continuing to operate its sleepers. In fact, the cuisine service, no matter of what type, is maintained at a great loss by the railroads, and solely in the interest of the traveling public. It may be regarded as a legitimate bit of advertising.

Without going into a discussion of the kitchens, refrigerators, and other expensive equipment, with skilled chefs and highly trained servants, one has but to enter a modern American dining-car to realize why it is famous the world around. An atmosphere of quiet luxury greets one. Here are restful chairs, snow-white linen, choice flowers, gleaming silver, flawless glass, and careful detail in every appointment. The food is served as efficiently and attractively as in a high-priced hotel.

Last year the Baltimore and Ohio Railroad, in commemoration of its centenary, equipped its Colonial dining-cars with blue chinaware depicting scenes from its early history. And only a few months ago, the Southern Pacific placed six all-steel dining-cars equipped with roller-bearings in its service, at a cost of $60,000 each.

That the dining-car is operated at a heavy loss is not generally known; but all roads testify to this fact. For instance, the Southern Pacific lost on an average twenty-four cents on each and every meal served its patrons last year, and this was reckoned on commissary expenses only and did not include car repairs, exterior car cleaning, and the like, which are charged to the operating department. Charles Frederick Carter, of the New York Central Lines, is authority for the statement that about fifty million meals a year are served on dining-cars at a loss of between six and seven million dollars. "But," he adds, "the dining-car is a necessary evil, so that railroads keep on bragging about the superior dining-car service and try to recoup the loss on something else."

"Crack" Trains and Modern Luxuries

With the evolution of the sleeping and dining-cars, and the vestibule platform so that passengers might pass from one part of the train to another at will, modern roads were not slow to realize the possibilities of other special types of cars, such as "parlor," "buffet," "observation," and the like. Then came the "limiteds," and other "crack" trains in which every convenience of the stay-at-homer could be duplicated. Such trains are, in fact, small, self-contained communities on wheels.

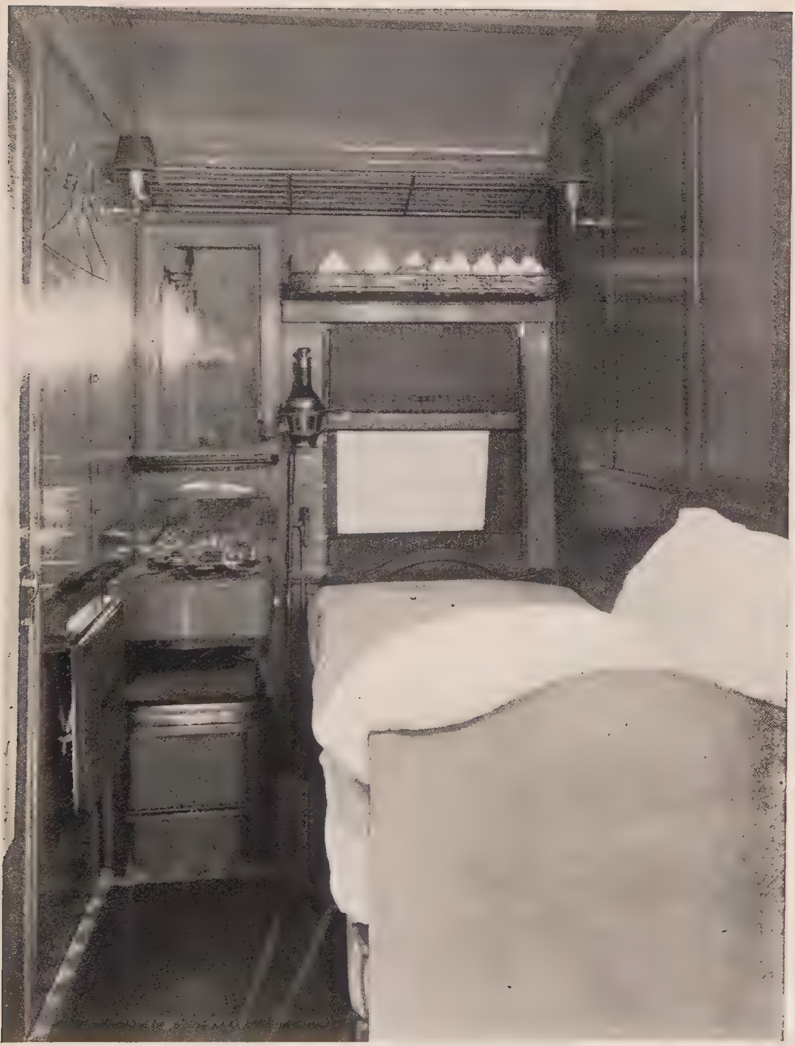
Coming down to our own immediate day, we are all familiar with the contemporary types of parlor-cars and chair-cars which assure the traveler of an assigned seat in advance, thereby removing the possibility of a prolonged and often unsatisfactory search for a seating place in the crowded day coaches, and also providing the luxury with all that the name applies when the lucky holder of a reservation boards the car and takes the chair assigned to him.

When we come to the sleeping-cars, we find a wide difference in arrangement, whether we travel east to west, or north to south. Many trains, and especially so do we find this on the transcontinental limited, have varied types of section-compartment-drawing-room sleeping-cars. The average sleepers on our regular express trains have their series of upper and lower berths arranged on each side of the aisle, with the ever-present men's and women's room at each end of the car, but the limited de luxe specials afford an even greater luxury. There we have our choice of the regular sections, a compartment or a drawing-room. The latter are very much in demand by family parties and parties of friends, which besides assuring the members of privacy also afford more luxuries. Here are all the modern conveniences of the home we have left behind: reading lamps, clocks with small electric night lamps above, electric circulating fans, individual heat control, cabinets, clothes hooks, racks, the doors provided with knockers instead of the usual buzzers, and a shoe servidor with a door in the corridor wall enabling the porter to remove and return the shoes without disturbing the occupants.

Some roads, particularly the transcontinental, have what they term single-room observation-cars, which contain in addition to a half dozen individual bedrooms, with regular beds instead of berths, a women's lounge room and at the rear end an observation parlor with writing desk, library table, lounge, etc. This naturally being the last car on the train, an open observation platform adjoins the parlor.

Within the last year and a half, an innovation in Pullman sleepers has been put in service by a few eastern roads, notably the Pennsylvania and Baltimore and Ohio between Washington and New York, and the Michigan Central between Chicago and Detroit, as well as the Southern Pacific's fast train the "Lark," running between Los Angeles and San Francisco. The Pullman people themselves think highly of their latest creation and say that "when a passenger boards this car, and goes into a room, it is like walking into a hotel bedroom." The beds and furnishings are "of a luxurious type and represent a combination of ideas of the best manufacturers." Full toilet facilities are provided, with hot and cold water and a dental faucet. Here the patron will find a folding table, waste-basket and rack for towels, mirrors, thermos bottle and glass. This type of car is not adapted for daylight travel, but for single night runs.

In connection with various types of de luxe Pull-



Courtesy, Pullman Company

PRIVATE ROOM

On the new type, single-room, overnight car used for sleeping on one-night runs. Note the collapsible washstand, desk, and other conveniences

man cars attached to limited trains for the use of patrons holding reservations in parlor or sleeping cars, all sorts of conveniences and luxuries are provided. These cars variously designated as "lounge-cars," "club-cars," "salon-buffet-cars," and "observation-cars," afford the travelers all that they had access to at home in the way of necessities and luxuries: shower baths; writing desks provided with writing materials; a library of books, periodicals and newspapers; sun parlors; soda fountains and kindred allied stands; telephone connections at terminals; the services of either a stenographer, a maid who is also manicurist and hairdresser, or a barber who can act as valet or tailor; and now the radio,—all at the service of the passengers.

The leading roads have become quite proud, and justly so, of their famous limiteds, and the occasions of the recurrences of their birthdays are made much of. Last year, both the Pennsylvania and the New York Central observed the silver anniversary of their two crack trains running between New York and Chicago, the former doing honor to the "Broadway Limited," and the latter to the "Twentieth Century Limited," while the Baltimore and Ohio observed the fourth birthday of the "Capitol Limited" running to Chicago. Similarly, out west the Rock Island and the Southern Pacific jointly were celebrating the twenty-fifth anniversary of the famous "Golden Gate Limited," running between Chicago and Los Angeles.

In every section of the country these de luxe trains now operate, and the extra fares which they charge are paid as a matter of course. Your traveling American likes the best of everything, and is prepared to pay for it. As one traveler whimsically put it: "I can economize at home!" The long-distance flyers are often made possible by the combination of three or four connecting lines. But the passenger who gets on board a Pullman car in Washington, D. C., and travels without change of cars clear to San Francisco, does not trouble his head about the different lines traversed.

The crack trains are usually given some catchy cognomen peculiarly applicable to the region traversed. A perusal of the rather lengthy lists of limited trains forces one to the conclusion that some advertising man, or other official, has been lying awake of nights cudgelling his brain for apt titles.

In New England the Boston and Maine has her "Flying Yankee," "Pine Tree Limited," and "Minute Man"; the New Haven has her "Knickerbocker Limited"; while coming to the Middle Atlantic States the Pennsylvania boasts of her "Broadway" and "Liberty" limiteds and the "Spirit of St. Louis"; the New York Central prides itself on the "Twentieth Century" and "North Shore" limiteds; the Baltimore and Ohio "points with pride" to the "Capitol" and "National" limiteds; while the Erie has her "Pacific" and "Atlantic" expresses.

Turning to the southland we find such trains mentioned as the "Queen and Crescent" of the Southern Railway; the "Southerner" and "New York-Florida

Limited" of the Seaboard Air Line; the "Florida Special" and the "Havana" of the Atlantic Coast Line; while the Norfolk and Western "offer a new standard of service in the 'Pocahontas' and the 'Cavalier.' "

In the mid-west the Illinois Central has her "Panama Limited" and "Diamond Special"; the Rock Island, the "Rocky Mountain Limited"; the Burlington, the "Yellowstone Park Comet" and the "Night Hawk"; the Chicago and Alton, the "Hummer"; the Missouri Pacific, the "Texan and the Sunshine Special"; the Frisco, the "Sunnyland" and the "Meteor"; and the Louisville and Nashville, the "Pan-American."

Of the transcontinental systems, the Union Pacific operates the "San Francisco Overland"; the Milwaukee, the "Olympian" and the "Pioneer Limited"; the Northern Pacific, the "North Coast Limited"; the Santa Fe, the "Chief" and the "California Limited"; the Southern Pacific, the "Golden Gate Limited" in connection with the Rock Island; while the Great Northern has her "Oriental Limited." The Southern Pacific, also, in connection with the Chicago and North Western and the Union Pacific, operates the "Overland Limited" from Chicago to San Francisco.

XIX

MODERN LOCOMOTIVES AND SAFETY APPLIANCES

Two important factors in the giant strides of American railroading in the last fifty years have been the development of modern locomotives and the installation of safety devices. The story of the American engine is worthy of a volume in itself, and I can but briefly summarize some of the salient facts brought to my attention by the railroads and the locomotive builders.

Any one who has compared the pygmy engines of the past with the monsters of the present must halt in amazement at the contrast. The Baltimore and Ohio exposition of 1927 had a most impressive display; while the New York Central has staged a permanent exhibit of some of its first models, in a gallery of its metropolitan station.

As an interesting commentary, let us compare the first engine constructed by Matthias Baldwin, founder of the great works bearing his name, with some of our contemporary giants of the rails.

The "Ironsides," constructed in 1832, had four wheels, the rear pair being the drivers, fifty-four inches in diameter. The cylinders were nine and a half inches in diameter, with an eighteen inch stroke, and were attached horizontally to the outside of the smoke box. The spokes of the wheels were of wood, as were the rims, the latter being encircled with wrought-iron tires; the hubs were of cast iron. The wheels were inside the framework, which was also of wood. The boiler had a diameter of 30 inches, and contained 72 copper tubes. There was no cab, and the small tender was of wood. The weight of the engine was five tons.

As a contrast, here are the dimensions of some of the standard engines now in use on the Pennsylvania system: cylinders 24 inches by 28 inches; diameter of drivers 68 to 72 inches; steam pressure 205 to 250 pounds; firebox 168 inches by 96 inches, grate area 112 feet, weight of engine 300 tons, and with tender 400 tons.

Or take the new Southern Pacific type for heavy mountain haul: cylinders 25 inches by 32 inches; diameter of drivers 63½ inches; weight of engine 221 tons, and with tender 344 tons. The length of the engine and tender combined is 101 feet. The management states that this type, with its 4-10-2 wheel arrangement, having a tractive power of 84,200 pounds, can handle the same tonnage, 1100 tons, over the Sierra Nevada Mountains, at the rate of ten miles an hour, as their former Mallet locomotives, with a 2-8-8-2 wheel arrangement, could haul at the rate of eight miles an hour. This type of locomotive is equipped with three cylinders instead of two, and was built by the American Locomotive Company.

For many years various standard types of locomotives have been given names which stand for a certain wheel arrangement. The period of sixty to eighty years ago saw the introduction of the American type for passenger service and the ten-wheeled for freight. The American locomotive was of the 4-4-0 arrangement, which meant that the leading engine truck had four wheels, two on either side, followed by four driving wheels; while the ten-wheeler, or the 4-6-0 type, had four leading truck wheels and six drivers. In these cases, neither type had what is called a trailing truck.

Of the more famous types of to-day, we have the "Decapod," 2-10-0 type; the "Atlantic," 4-4-2 type, the latter figure standing for the number of wheels under the trailing truck; the "Pacific," 4-6-2 type; the "Prairie," 2-6-2 type; the "Mikado," 2-8-2 type; and the "Mogul," 2-6-0 type.

One of our modern famous types for heavy hauling on steep grades or overcoming other adverse conditions is the Mallet, known as an "articulated" locomotive, the term standing for two different sets of driving wheels, each set on its own trucks, and operated by separate engines. These locomotives have two cylinders on each side. The wheel arrangement varies, and in designating the types, four sets of figures are used, as 0-8-8-0, 2-4-4-2, etc., the second and third figures setting forth the information that two sets of drivers are used.

The first Mallet used in this country was built by the American Locomotive Company and purchased by the Baltimore and Ohio. On exhibition at the St.

Louis Exposition in 1904, the new type did not seem to meet with popular approval until two years later, when Hill, of the Great Northern, ordered from the Baldwin Works five locomotives of the Mallet compound articulated type. So succcessfully did they operate for the Great Northern, that other roads soon fell into line.

Recently the Southern Pacific has introduced a new wheel arrangement of a 4-10-2 type, which is therefore known as the "Southern Pacific" type. Another famous type of western engine was introduced, in 1903, by the Atchison, Topeka and Santa Fe, for their heavy mountain haul, and has been dubbed the "Santa Fe." This has a wheel arrangement of 2-10-2, it being deemed advisable to improve on the "Mikado" type by adding an extra pair of drivers.

Two other recent innovations deserve mention, one introduced by an eastern road, the other a western. The New York Central has recently purchased from the American Locomotive Company sixty engines, called "Hudsons," each of which has four leading wheels, six drivers and four trailers; while the Great Northern, as a result of experiments conducted in their mechanical department, placed an order with the Baldwin people for four locomotives which they claim will mean something like a twenty per cent increase in tractive power. These are of the simple, articulated type, as distinguished from the compound Mallet, the steam is fed into the rear high-pressure cylinders, and the exhaust carried to the forward low-pressure cylinders, while in the new model, both sets of cylinders are high-pressure, fed with live steam.

In 1868, shortly after Alexander J. Cassatt assumed the position of Master of Machinery, an effort was made by the Pennsylvania Railroad to standardize locomotive designs in the interest of efficiency and economy, in view of the heterogeneous types then in existence on American roads. Drawings were prepared at the Altoona Works and ever since practically all locomotives, whether built by the company or locomotive manufacturers, have conformed to designs laid down by the officials.

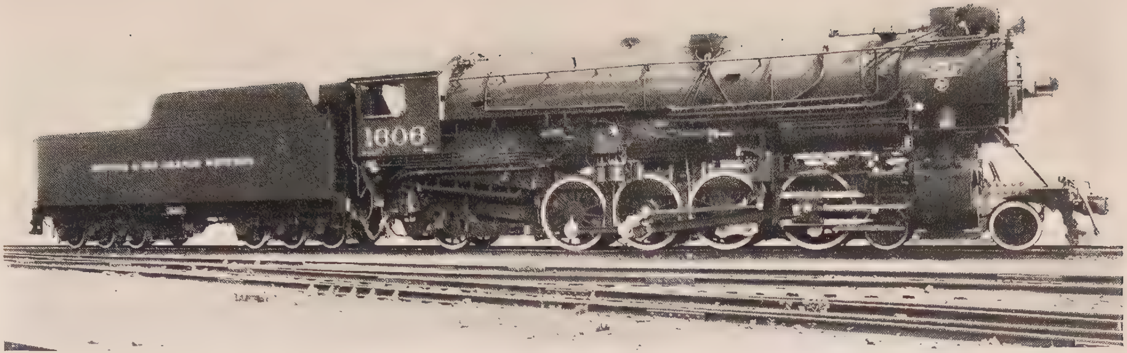
For instance, to-day a "Mikado" type locomotive, classed as an L1, intended for heavy freight service, weighs about 160 tons, and with the tender 250 tons; a "Decapod," class I1, for standard freight service, weighs approximately 190 tons, and with the tender, 300 tons; while a standard passenger locomotive, "Pacific" type, K4, weighs 140 tons and with tender 235 tons.

Paul D. Warner of the Baldwin Works, in his comprehensive treatise on "Motive Power Development on the Pennsylvania Railroad System," says that "the work of building up the Pennsylvania system has been accomplished on a conservative basis, using sound judgment, but never hesitating to make improvements which would enhance the value and efficiency of the property. . . . Motive power development has been accomplished along the same general lines as those on which the system has been built. . . . As a result of this policy, there has been developed a Department of Tests at Altoona, which in point of complete equipment and valuable research work accomplished has no equal among the railroads of the United States. Furthermore, the results of locomotive tests made on the Altoona plant have been widely published, and railroads the world over have been able to profit by them." And Mr. Warner is authority for the statement that as early as 1860 Altoona "had become a household word among American railroad managers, and the quality of the work turned out was generally recognized for its excellence."

The business of building locomotives in this country has assumed almost gigantic proportions. The Baldwin Works, which in the first year of its existence built one locomotive, the following year none, and the third year five, has steadily increased the plant capacity so that its annual output now runs up into the thousands, 3,580 being constructed in 1918, the last year of the World War. Practically all the countries of the world have been supplied with their product, and since 1895 they have also been constructing electric locomotives. I have seen a recent statement issued by the Southern Pacific in which it is claimed that "while still less costly than prunes and not half so expensive as butter," the price of locomotives has increased more than ten cents a pound since 1915.

As the various types of locomotives have been introduced and established, one of the new problems raised has been to enlarge the dimensions, thereby enabling them to handle larger train loads. Also the various essential parts have grown materially from the time they were first introduced. The evolution from the five or ten ton locomotives, of pioneer days, to the massive giants now hauling the trains has been gradual but continuous. Another modernism is to restore the personality, so to speak, of the engines. Too long have they been merely black machines, without names. The Baltimore and Ohio recently put into service a new fleet of locomotives, and reverting back to an old custom, painted them in bright colors. They are olive green, striped with red and gold, and are named after the Presidents of the United States, the first one naturally being called the "President Washington."

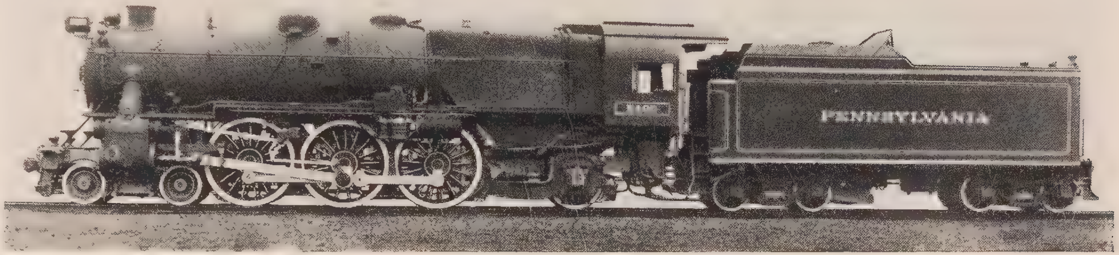
The signal system, by which the conductor of a passenger train signals the engineer on the cab was a thing unknown on our early roads. Many stories are told of various roads as to how the system originated, the usual tale being that the conductor, in seeking some method of signalling the engineer, hit upon the expedient of attaching a piece of wood to a cord, one end being attached to the rear of the train in some manner, and then passing through the cars or coaches to the engine. The latter end, to which the piece of wood was tied, was left dangling from the roof of the cab, and by jerking the string the piece of wood was made to bob up and down and call the engineer's attention to the fact that the conductor was signalling to him. And, as the story goes,



Courtesy, Baldwin Locomotive Works

A MODERN FLYER

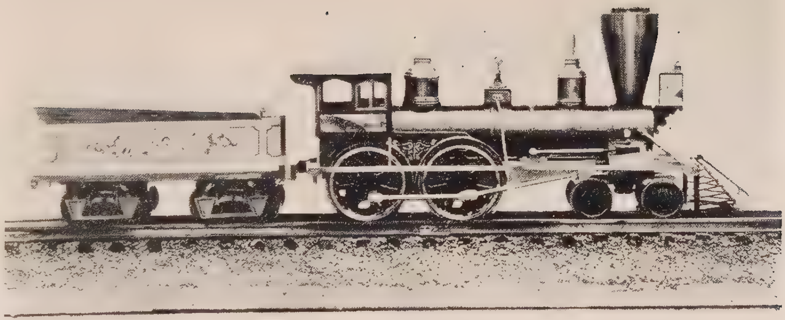
Type of fast locomotive with great tractive power, for use in the Rockies



Courtesy, Pennsylvania Railroad

MODERN PASSENGER LOCOMOTIVE

Capable of both sustained speed and great tractive power. The six driving wheels are each 80 inches in diameter, or nearly a foot taller than the average man



Courtesy, Pennsylvania Railroad

THE "TIGER"

Used by the Pennsylvania Railroad between 1855 and 1865 and typical of the period

Courtesy, Baltimore and Ohio Railroad

the engineer, who disliked dictation from the white collared "official" back in the cars, paid no attention to the contraption until either thrashed by the conductor or bluffed into submission.

Constant changes for a betterment have always been the order of things on American roads. Take the matter of the injector, which is a contrivance for supplying the boiler of an engine with the necessary amount of water. The invention of a Frenchman, it was introduced into this country in 1860, as the "Giffard" injector, by William Sellers of Philadelphia. Crude though it was, as compared with our modern appliance, it almost immediately found favor with the railroad managements and it was not long before American ingenuity started the constant series of improvements which are said to have modified the original "beyond recognition."

Also about the time the injector was introduced, the need of a brake more efficient than the ordinary hand-brake, especially in passenger service, was becoming realized. The Liughridge Chain Brake was used to a considerable extent on the Pennsylvania and was one of the most effective devices of its class. It was arranged with a friction wheel, which could be pulled up against the right-hand rear driving wheel of the locomotive. As the friction wheel rotated, a chain was wound up on its shaft, and the pull of this chain was transmitted to the brake-shoes throughout the train. Then came that epoch-marking invention, the air brake, which we will discuss later.

The development of the American locomotive is nowhere shown better than in the matter of the headlight, which was brought out most interestingly by the Baltimore and Ohio in the "Fair of the Iron Horse" held in 1927. Ninety years ago, the approach of a night train was heralded by what to us must seem a most primitive affair. The engine pushed a flat-car ahead of it, on which was a pile of sand. Behind the sand was an iron reflector with a whitewashed surface. On the sand a bonfire of pine knots was kindled, the glare being accentuated by the reflector, which did a double duty in that it also kept the light out of the engineer's eyes. After that came the crude kerosene headlight with its reflector, and finally the powerful electric light.

About twenty-five or thirty years ago, the matter of superheating was being tested out, and soon came into its own, and to-day in railroad parlance we hear much of "superheater" engines. By superheating is meant that process whereby the steam passing from the boiler is communicated not directly to the cylinders, but first passes through a device which raises the temperature say from 400 degrees to 650 degrees, thereby increasing its efficiency.

Many American locomotives are now equipped with mechanical stokers, which do away with the firing by hand. The fireman, instead of shoveling the coal into the fire box, controls the delivery of the fuel as needed. In this the coal is conveyed forward from the tender, passing through a mechanism which crushes the coal to a proper size. The fire-box is equipped with distributors which spread the coal over the fire area. There is also another contrivance in use on some locomotives, which are "hand-fired," called the coal pusher. After the fireman has shoveled from the tender the coal within reach, the pusher is brought into operation and shoves another supply forward for the next baling.

As stated elsewhere, wood was the fuel first used for combustion purposes, and this was followed by experiments with anthracite coal, coke, lignite and bituminous coal. In addition to the coal burners, we now have the oil burners, such as are used on the Florida East Coast Railroad, the Southern Pacific, and other roads. The oil-burning locomotive was introduced about the beginning of this century, as a result of the discovery of vast quantities of crude petroleum in the Texas oil fields. Several of the roads entering this region tried out the product and so successful were the experiments that to-day practically the entire Southwest is using oil burners.

Oil-electric locomotives are also coming into use. "The internal combustion engine is considered the most efficient form of prime mover at present available," says one official. "By its use the automobile and self-propelled car have become possible. The electric drive has demonstrated that it offers the most efficient and most easily controlled form of power transmission. The combination of the electric drive with the oil engine offers possibilities for far-reaching development in railway transportation."

About two years ago, the Great Northern installed a Diesel oil-electric locomotive at Minneapolis for switching cars. This engine was the joint product of the Ingersoll-Rand Company, the General Electric Company, and the American Locomotive Works. "It is equipped with two internal combustion engines of 300 horsepower each, using a low cost fuel received direct from the oil fields at Kevin, at a cost of about 3¼ cents a gallon. These combustion oil engines in turn drive the electric generator from which direct current is produced, to the motors, which are geared to the driving wheels. By the use of the oil-electric locomotive all coaling is eliminated, also cleaning of fires, ash pans and taking water, as required by the steam locomotive, making it possible for the engine to remain in service continuously for twenty-four hours. . . . The locomotive is operated the same as a steam engine, by an engineer and fireman."

The electric locomotive is of comparatively recent origin. The Baldwin works put out their first electric locomotive in 1895, and with the passing of the years the use has become more general. At first intended for use in tunnels in order to overcome the accumulation of smoke and gas when steam power was used, and at terminal districts, such as the Pennsylvania and New York Central Stations in New York City, it has now been greatly extended and we find some of the great Western lines, particularly in the Northwest, using it successfully on the heavy mountain grades.

The Chicago, Milwaukee and St. Paul road have now three of their divisions of heaviest gradient 660 miles in length electrically operated and likewise very successfully. "During the winter period," says the management, "the electric locomotives have shown themselves especially serviceable, delays due to low temperatures being eliminated, and in the Bitter Roots, where the deep snows cause much trouble, electrical operation has proved much more reliable than steam. Under electrical operation, the locomotives, instead of being changed at the end of each engine division of about 110 miles, can remain in service continually, with a light inspection at the two ends of the electrified territory or until called into shops for general inspection or repairs." About ten or twelve years ago when the initial experiment was made on the Milwaukee, the vice president stated that "our electrification has been tested by the worst winter in the memory of modern railroaders. There were times when every steam locomotive in the Rocky Mountain district was frozen, but the electric locomotive went right along. Electrification has in every way exceeded our expectations."

The Great Northern is now electrifying a portion of the Cascade region which when completed will take in about eighty miles of railroad. With reference to the four locomotives recently purchased, the management states that they are the most powerful electric locomotives ever built. "They are unique in that they take advantage of the merits of both alternating current and direct current systems and are of the motor-generator type."

Each locomotive consists of two cabs which are identical, having the same mechanical arrangement and same electrical arrangement, but will be operated together as one road locomotive. However, each of the units can be operated alone; by a simple application of couplers and draft gears in place of the drawbar arrangement, it will be possible to use them as individual units. Each double unit weighs a total of over 350 tons.

"Electric locomotives are now operating in every department of the railroad transportation system of the United States," says the General Electric Company in a recent statement; "main line freight and passenger business, switching yards, suburban and terminal electric zones, and more recently with the oil electric locomotive and the gas-electric car, the handling of light-traffic, branch-line business. Electricity has demonstrated its ability in every field to handle heavier trains at higher speeds, thus in one stroke increasing the capacity of a given set of tracks, expediting the handling of business, reducing the cost of labor and material, and thereby improving the net revenue."

The General Electric Company has issued a vast amount of informative data of an interesting nature having to do with the electrification of many of our American roads. The most extensive electrification in the world, that on the Milwaukee, was installed in accordance with the engineering recommendations of the staff of the General Electric Company, and with them was placed in 1914 the contracts for electrifying the divisions. The report of President Byram covering the first eight and a half years of operation showed a net saving over steam operation of over twelve millions of dollars, after making all allowances for interest and depreciation charges of the fifteen million addition to capital account. Actually, the operating costs were reduced over nineteen million dollars.

The Baltimore and Ohio, which was the first trunk line to adopt electricity as a motive power in connection with the building of its Belt Line in the city of Baltimore in the early nineties of the last century, has purchased eleven electric locomotives of General Electric make, eight of which are still in service.

One of the most famous examples of early main line electrification is the Butte, Anaconda and Pacific Railway, a short line in Montana, operating between the mines at Butte and the smelters at Anaconda. The General Electric furnished the entire equipment and the first electric locomotives were put in service on May 28, 1913. Gradually the entire freight and passenger traffic was taken over, and to-day the entire line is operated electrically. It is estimated that there has been a net annual saving of more than 20 per cent when compared with what steam operation would have cost under similar conditions. Indeed, it was the unqualified success of this little road which was largely responsible for the Milwaukee adopting their electrified divisions.

And within the last few months I have seen an announcement in the papers of a "three-way" locomotive being tried out by the New York Central. It is called a battery-oil-electric switching engine and operates either on a third rail, by its own power plant, or from an overhead conductor.

Coincident with the progress of railroading of recent years has come the famous slogan "safety first," not only for the safety of the great traveling public, but of the employees as well. Indeed, considering the great game of railroading as it is played to-day, the enormous amount of passenger and freight hauling which takes place in a year's time and the rate of speed which is demanded, the comparative safety which is everywhere encountered is little short of marvelous.

In order to do this, however, the roads must keep "on their toes" at all times. Each new innovation brought out must first be tested and tried before adopted; and employees must be educated in avoiding or side-stepping the pitfalls and more open dangers incident to modern railroading, with its complexities. The employees in the different departments—and how many different departments there are only those in the railroad game are aware—must be instructed in looking out for the safety of themselves, the great traveling public, the equipment and commodities handled, as well as the trespasser and autoist who is courting involuntary suicide at the grade crossings.

"Cross Crossings Cautiously" campaigns are stressed; safety first campaigns are held between different competing divisions of the same road, the one

Courtesy, Baldwin Locomotive Works

MODERN FREIGHT LOCOMOTIVE

A typical, high-speed locomotive in use on the Santa Fe Railroad

maintaining the highest average receiving a banner; periodic medical examinations of employees are given, as well as examinations in the book of rules and the use of the air-brake for the trainmen; and instructions in the use of signals are only some of the more important features which can be mentioned.

The steel rails before being sent from the plants are submitted to most exacting tests and inspections. On many of the first-class roads the wooden ties now are subjected to a treating process which, besides rendering them more fit to stand up under the strain, increases their longevity; the various types of rail joints designed by "specialists" are constantly undergoing improvement; the rail anchors, intended to prevent what is called the "creeping" of the rails, and the improved tie plates, minimizing the tendency to accident by preventing track spreading, are but some of the major elements which go .into the make-up of the modern track.

When it comes to train running, the best is none too good for our roads, and we now have the telephone largely supplanting the telegraph in train despatching, and at some future date we may have the radio; then there are the various systems of fixed signals, the semaphore, the mechanical and the electric interlocking appliances; and the up-to-date couplers which are practically impregnable against all shocks.

The development of the modern air-brake for steam road service, however, deserves more than passing mention. But it should be remembered, as the

Westinghouse people themselves have said, that while usually considered "a safety device, par excellence, yet it has other reasons for its existence."

We are told that the use of a brake as applied to a moving vehicle in order to retard the speed dates back not farther than three hundred years ago, at which time various simple devices were in use in England on the existing tramroads which ran from the mines to waterways. These primitive tramroads, the forerunner of the railroad, consisted of pieces of wooden rail, over which the vehicles passed, laid on the wagon roads. By various means, sometimes by hand, blocks along the side of the vehicle were forced against the tread of the wheel when the speed was to be retarded. These were in use until the advent of the steam locomotive, when it was seen that an improvement would have to be made on a manually operated brake. Commencing with Stephenson in England, in 1833, various mechanicians tried their hand with varying success in experimenting on the air-brake, but it was not until 1869, when George Westinghouse took out his first patent for the Non-Automatic Air-Brake, that the first practical advance looking to a solution of the problem was taken. With the evolution of the railroad the air-brake had likewise to be improved to conform to the new standards, until the advent of the automatic air-brake, now so essential to safety in the event of cars separating.

The present management of the Milwaukee road prides itself on the fact of its being the first railroad to make use of the application of roller bearings to passenger trains. All the cars on its crack limited trains are equipped with this "epoch-making discovery" as they call it. They go on to say, "this is a simple enough statement, but one of almost startling importance in its application to the ease of operation of the train and the increased comfort of the passenger. The friction of old-type journals being eliminated, it is apparent that the train starts with the minimum application of power and so gently as to be almost imperceptible to the passenger. Not only so, but the train in gliding into motion does so as a single unit because of the friction buffers at the ends of each car which eliminate the slack usually found between the cars of a standing train. Consequently the combination of roller bearings and friction buffers means a gentleness in starting and stopping and an effect of easy gliding motion that heretofore have never been approached in the operation of passenger trains. No jars, jerks or jolts!

"Roller bearings being made of the finest and most durable steel are guaranteed for a million miles in service; they minimize the friction, side thrust and shock; maintenance costs are reduced, inspection being necessary only between relatively long periods instead of several times daily as with ordinary journal bearings; only one-seventh the usual effort is required to start a train; there is a saving ranging from seven to fourteen per cent in fuel and a complete elimination of the ordinary hot-box trouble."

Another innovation to which particular reference should be made is what is termed automatic train control, now in process of installation on our trunk lines.

As one road has recently put it, the Norfolk and Western, "with both train control and automatic signals in operation, either rear-end or head-on collisions are guarded against in every possible way. In case an engineer should become incapacitated from any cause whatsoever while handling his train, and signal indications or train orders are ignored, the automatic train control device comes into action and takes charge of the train, bringing it to a stop before the danger point is reached. The train control device also compels the engineer to handle his train within prescribed speed limits, but does not interfere with his handling of the train in any way, provided he keeps below the prescribed speed limits and strictly obeys signal indications."

The desired results are obtained by an apparatus located on the engine of a train acting in conjunction with the automatic block system.

The Union Pacific system has a novel plan in line with safety efforts. Electrically charged special fencing is placed along the track at certain places for the purpose of preventing loose rocks and soil from getting on the track. This fence is so connected with the automatic block signals that any disturbance of the fence will cause the block signals to display the stop sign, and thereby warn the engineer coming in either direction that something is amiss. This road also has a scheme for avoiding accidents that in the past have happened to other roads by reason of passing trains or railroad men working on the line mistaking the identity of a train and assuming that it was the only one to be expected, or the last of two or more sections, when in reality another was following. This mistaken identity is avoided by placing on either side of the smokestack of the engine, the train number. For two consecutive years, the Union Pacific has been awarded the Edward H. Harriman gold medal by the American Museum of Safety, which annually goes to the road "for the utmost progress in safety and accident prevention during the year."

XX

THE FUTURE OF AMERICAN RAILROADING

As we bring to a close a survey of the first hundred years of American railroading, the question forces itself upon us: What of the future? So many new elements enter into the problem that it is one of deep interest. So far as equipment and luxury are concerned, it would seem that the railroad had reached its zenith. But what of its future as an economic factor? The canal of yesterday has ceased long since to be a rival; but in its stead we have the highly improved highway and the motor truck; we have the agitation for improved waterways; we have discussion of the relative merits of steam, gasoline, and electricity; we have the airplane being groomed for the carrying of both passengers and freight.

What will the next fifty or one hundred years bring forth? The present writer prefers to answer the question in the words of other, more experienced railroad men. I have obtained the views of typical leaders in the industry, representing all sections of the country, and I append them without comment.

Samuel Rea, the former president of the Pennsylvania Railroad, has this to say:

> "Briefly, my views are that, fifty years from now, the railroads will still be performing the bulk

of our transportation service, particularly in freight. . . . In their relations to railroads, the most important function of motor vehicles will doubtless be to act as collectors and distributors at terminals, inter-terminal hauls being more efficiently performed by rail. Motors will doubtless absorb in the future a greater proportion of the shorter distance passenger traffic than at the present time. In the freight field their economic utility will always be more circumscribed, except for collecting and distributing purposes in terminal zones and for reasonable distances around towns and cities. In the great majority of cases, comparatively long hauls of freight, in any considerable quantity, must in the nature of things be better and more economically performed by rail. . . . Anyone who expects to see airplanes supplant railroads as the principal means of passenger travel, is, in my opinion, making a very wild guess. Many factors, such for instance, as the strength of materials, must necessarily always limit the size of airplanes and keep the number of passengers possible to be transported in one machine down to a comparatively small number. Therefore, my expectation is that air transport will evolve a de-luxe high-speed passenger service, with genuine, but distinctly limited, utility for long distance travel and special requirements, and at necessarily high rates. I do not think it can possibly be a factor of any moment in freight service, though it doubtless will develop a field in express service for light articles, at high charges. . . . In so far as the railroads themselves are concerned, the

> progress of the next fifty years seems likely to be more a matter of orderly development than of radical change. . . . Electrification will be greatly extended, although it is extremely doubtful whether it is at any time destined to supersede steam entirely as the principal motive power."

To-day we hear much of proposed mergers, increased taxes, the rising cost of labor and maintenance, and the consequent loss in revenues from motor truck and bus operation. To offset the latter, many of the larger roads are inaugurating their own motor service. Recently a Southern Pacific official stated, in connection with the ceremony incident to launching a "palatial passenger motor coach" service in western Oregon, that that road is the sixty-second railroad in the United States to supplement its railroad passenger service with highway motor coaches. For example, the Baltimore and Ohio, about two years ago, started what is called a Motor Coach Train Connection Service between the heart of New York City and its terminal in Jersey City.

Other executives when asked by the writer as to the future of railroading replied as follows:

> "Prophecy is a speculative and dangerous business," said Mr. Hale Holden, president of the Burlington, "but I am willing to hazard brief reply. The age of invention and scientific discovery is not past and new mechanical processes are constantly in the course of development. It does not seem beyond the bounds of possibility, therefore, that transportation methods may be

greatly changed within a hundred years—perhaps radically. However, so far as the future can be predicated on the present, I think the railroads of this country will continue for an indefinite period to hold the bulk of long-haul freight and passenger business. Indeed, it is well-nigh impossible to conceive an adequate substitute.

"The short-haul traffic has been going in increased volume to the motorized vehicles, and this tendency appears unlikely to be checked until highway space is no longer available within the limits of safety and economic use, or until the people revolt against ruinous taxation for building and maintaining hard roads. And when the earth fails to yield a bountiful supply of oil I have no doubt that alcohol or some cheap synthetic fuel will have been adapted to the internal combustion engine. To gain the convenience of door-to-door handling, my opinion is that railroads generally will take on the motor truck and bus so far as these can be efficiently related to rail service.

"As in every process of mechanized industry, the future of transportation is wrapped up with the production of power. When water power and central coal plants have reached the stage of development when cost of power and equipment will compete with present cheap coal, I anticipate that electric operation of railroads will largely supersede the steam locomotive.

"I am not disposed to give an important place to the airplane as a commercial carrier in competition with the railroad even in the distant future. While the airplane must be conceded to have many

> emergency uses, and undoubtedly has greater possibilities, my belief is that it has inherent disabilities that will be difficult to remove. For one thing, it occurs to me that too much power is required per pound of load to make the air machine practicable for carrying heavy burdens within the economic limit, as we understand it in this generation.
>
> "Speed, however, appears to be one of the dominant passions of our times, and this may operate to enlarge the use of airplanes for transportation purposes. By the same token I think it improbable that the inland waterway will become a serious competitor of the railroad except for freight to which time is of little or no consequence; provided the waterway project is made to stand on its own economic bottom. But the present policy of government is to subsidize this competitive agency of transportation through the furnishing of facilities to shippers at less than cost; and how long taxpayers will approve this program is a question that bears directly upon the future of railroads."

Mr. W. B. Storey, president of the Atchison, Topeka and Santa Fe Railway System, says that it is impossible for him "to visualize, even in vague outlines, what developments may take place in one hundred years." However, he says "there are a few points that I think may be taken as assured.

> "In spite of motors, airplanes, and waterways, the future business of the country will be handled by railroads. Motors may handle a certain amount of traffic, but this will not affect the long-distance

movement or the movement of heavy commodities. The motor may be used for distribution purposes, spreading out to communities located at a distance from the railroads. However, as to whether the railroads will develop to control the motor traffic of the country I am in no position to judge. There may come improvements in motive power as, for instance, a Diesel engine may be devised which will supplant steam. It does not seem at present that electricity will take the place of our present methods of developing power, although it may be used to a certain extent in cities and terminals.

"So far as waterways are concerned, I do not look for any great change in this respect. There is a sentiment in the country at the present time that waterways will be a great addition to the rail lines so far as assisting in handling the business of the country, but I am very definite in my opinion that the rail lines will have to rely upon their own efforts and keep up with the demands of commerce without counting on any aid from the waterways. One thing that militates against the latter is the five-months period in the north where waterway traffic must cease due to ice and cold. The railroads must be equipped to take care of the business of the country during that period, and hence, looking at the matter from an economic standpoint, the plant which can handle the business during the frozen period can handle it efficiently during the entire year. Further, I believe the people of the country will finally realize that the cost of transportation by water is actually greater than by rail, when the money spent by the Government on building and improvement of waterways is taken into account. As an illustration of this, the Erie Canal costs the state of New York, for interest and maintenance, an amount of money which makes the cost of transportation on the Canal very much greater than if the freight were shipped by rail. As a matter of fact, if the money which the state of New York pays out for the Erie Canal was paid to the railroads the latter could afford to haul all the freight moved on the Erie Canal free and this sum would add largely to the present earnings of the railroads.

"Of course, in the future development of the railroads large sums must be spent to make them safer, as, for instance, in the matter of separation of grade crossings. The toll of human life at the present time due to the introduction of the automobile is very large and it is my belief that public opinion will demand the removal of the danger that comes from grade crossings. I assume, however, that the public will pay part of the charge for the elimination of these crossings, but in the aggregate the bill will be very heavy."

It will be recalled that the first transcontinental system was formed by the joining of the Union and Central Pacific roads. The opinions of Mr. Carl R. Gray, president of the Union Pacific System, and of Mr. William Sproule, president of the Southern Pacific which took over the Central Company, are therefore of interest.

"I do not believe that I can give you much enlightenment," says Mr. Gray, "but I do not believe that the railroads, as such, will ever get into the airplane business.

"With respect to the auto bus and auto truck, there is a growing use of these facilities as collateral with the railroads, but they are, or at least eventually must be, based entirely upon economic grounds. Where passenger train service can be reduced, a railroad is justified in engaging in the motor bus business, but it is very questionable whether such an action is justified unless there is a resultant economy in railroad operation.

"To an extent this same thing is true with respect to the auto truck. Where railroads are operating separate stations in a city, the use of the auto truck for purposes of consolidation is frequently cheaper than the use of the so-called trap car, and unquestionably facilitates movement. This is also true in localities where there is a very large volume of short haul package freight business.

"To a large extent this development is going to be governed by the public attitude towards such forms of transportation. In a number of states there is a growing disposition to bar from the paved roads motor vehicles with heavy wheel load, and to adopt methods of taxation which will have a direct bearing on the growth of business.

"In the matter of electrification it would require a prophet. The extent to which this will progress will depend upon two things: the density of traffic and the relative cheapness of electric

> power. Its growth will be much less in the West until a greater density of traffic is achieved, although the hydro-electric possibilities are greater.
>
> "Personally, I have no great apprehension about the railroads. The country is growing steadily and the demand for long-haul traffic increases with the population. In this business the railroads are the premier type, and I do not anticipate any form of transportation will seriously challenge their supremacy."

"I believe," says Mr. Sproule, "the railroads will continue for coming decades upon the same general line of development as in the past fifty years, and that they will not be supplanted by the public highways or the airways.

> "Highways easily become congested and transportation over them is sensitive to weather conditions. When weather conditions are favorable such transportation may be convenient but not economical. Transportation by air will always have to overcome the law of gravitation and involves great personal hazard. It is likely to continue so, and it is expensive.
>
> "On the other hand, the railroad systems of this country run day and night in every kind of weather, ready to handle passengers, freight, mail and express in all directions and for any distances.
>
> "As to motive power, there may be changes in the application of power and improvements in a variety of the devices, in response to the progress of industrial chemistry and of science, combined

with inventive genius. All will tend to progress in the improvement of rail service, but will not change the character of the railroad business. Electricity and even the radio, for example, may change in some details train despatching or train safety control, but they will be improvements that would not change the character of the railroad business. For another example, the railroads might find means of running passenger busses between local points on the rails, diverting the vehicles at a convenient point to the highway and at another convenient point divert them back again to the rails. While this might add flexibility to the passenger service, it would not change in any essential way the railroad business with respect to passenger traffic.

"In the progress of the world new facilities promote business. The telephone did not destroy the telegraph; neither of these has been destroyed by wireless. Each in its turn has become an added facility for human intercourse. Freight movement and passenger travel are merely other forms of intercourse necessary for our civilization. New facilities promote new wants and desires. Even Parcel Post with its big packages has not smashed the Express business. Both of them are doing an active business; one under the auspices of the Government, the other as a private enterprise under regulation.

"As to your question about electricity: So little is known about it up-to-date that it holds the vast unknown as the field of its future development. The unwieldy devices of to-day may be in the museums fifty years hence for the curious. It is also possible that the great low grade lignite coal areas may be utilized as the basis of power for the future of the railroads.

"Finally, under reasonable and constructive regulation that recognizes in a fair spirit the three interests, namely, of the owners of the railroads, of the employees and of the general public, the railroads will undoubtedly continue to give increasingly good service for a period projected as far into the future as you suggest. Their relation to the public henceforth will be just as important as in the past, for they give a necessary public service, traversing continental areas in all directions, for the distribution of all the products of our civilization and of its people. A good horse that gives good service is worthy of good treatment."

We cannot do better than close this chapter—and our book—with a letter received from Mr. L. A. Downs, president of the Illinois Central System, just as this book was going to press. Mr. Downs is typical of the modern railroad men of broad vision, who are free from the jealousies of fancied competition, and welcome all rational means of speeding up and making more efficient the transportation of our country. This is the attitude of many railroad men with whom I have talked, and is prophetic, I believe, of the railroads of to-morrow. And while they welcome these other facilities, they look upon them as auxiliaries, and believe that the lines of steel will continue to be the backbone of our transportation system. Says Mr. Downs:

> "The railroads constitute an indispensable unit of our economic machinery. The unparalleled growth and industrial development of the United States in the last three-quarters of a century—during which our national wealth has increased from 7 to 320 billions of dollars—has been made possible mainly by railway progress. Probably no other country on the globe is so dependent upon railway transportation for its continued prosperity.
>
> "As they grew to full strength, the railroads quickly demonstrated their superiority over every other form of transportation previously devised. They supplanted the stage-coach, the prairie schooner, the flat-boat and, with few exceptions, the canal barge and river steamboat, because their service was superior in speed, convenience, capacity and dependability. No other form of transportation proved so widely useful or so capable of adjustment to meet the changing needs of the country.
>
> "But what of the future? Are the trains in danger of being supplanted in turn by barges, motor vehicles, airplanes or other revived or modernly developed forms of transportation? Will the railroads occupy their present position of supremacy fifty or one hundred years hence?
>
> "It is impossible to do more than venture a guess as to what may happen in the transportation

world in the next hundred years. Science is advancing with such disconcerting rapidity that no one can foretell whether some new discovery or invention may not completely revolutionize or replace our present modes of transportation. So far as the known methods of transportation are concerned, however, no apprehension need be felt concerning the future security of the railroads.

"Certain important limitations of inland waterway transportation are inherent and cannot be overcome. This form of transportation is slow and subject to costly interruptions and delays due to floods, drouths, storms and ice. It will always be confined to a comparatively few commercial routes; where barges and steamboats can reach one community, the railroads can reach scores. In our modern industrial scheme the waterways would be practically helpless without the railroads to originate or complete the movement of their goods, whereas the railroads, in the vast majority of cases, can and do perform a complete transportation service without outside aid. Despite the commonly low level of waterway rates it is frequently cheaper, when terminal and rehandling costs are taken into consideration, to ship the entire distance by rail, than to incur the delays and costs incident to transshipment. Waterway rates, moreover, are depressed artificially by reason of exemption from taxes or maintenance of way charges or both, as compared with railway rates.

"Motor vehicle transportation likewise has its weaknesses and its limitations. It is true that motor transportation has made inroads upon railway passenger traffic and in some degree upon short-haul freight traffic, but considerations of distance, comfort and capacity per employee limit the value of motor vehicle transportation to certain clearly recognized fields. A broad view of the matter indicates, moreover, that the railroads have gained more than they have lost through the development of highway transportation. Railway freight revenue has benefited greatly from the increased movement of materials used in the construction of highways and of industrial plants and in the manufacture of automobiles, trucks and tractors, as well as from the movement of the motor vehicles themselves and the gasoline and oil required in their operation.

"The development of commercial aviation to a point where it will be felt in any appreciable degree by the railroads is a remote possibility. The airways of the future will probably be utilized in carrying mail and parcel goods and a small percentage of long-distance travelers, but the loss which the railroads seem likely to sustain in this direction will be so small and so gradual that its effect will be difficult to trace.

"Inland waterways, highway and air transportation all have places in our economic scheme, but the railroads will undoubtedly continue as the mainstay of the American transportation system. In 1900, for example, when the automobile was coming into use, the railroads performed 1,854 ton-miles of freight service for every person in the country; in 1927, with approximately 3,000,000 motor trucks in the country, the railroads per-

> formed 4,022 ton miles of freight service per capita. The per capita demand on the railroads more than doubled in twenty-eight years, and on top of that the country's population grew from 76,000,000 to 119,000,000."

With men of broad vision and sympathetic ideals, such as these, at the helm to-day, the future of American railroading seems indeed assured. As to its further progress in safety, comfort, speed, and refinement, it would appear difficult to imagine many additional steps. In some essentials the last word seems to have been said. And yet if we could but draw aside the curtain of the next one hundred years, how many marvels might yet be revealed!

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